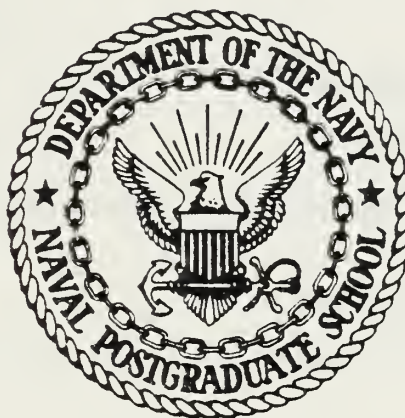


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AN ECONOMIC ANALYSIS OF MANPOWER
ALTERNATIVES FOR THE NAVY DRUG DETECTOR
DOG HANDLER FUNCTION

by

Mary P. Bruno
June 1983

Thesis Advisor:

K. J. Euske

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for the Navy Drug Detector Dog Handler Function

by

Mary P. Bruno
Lieutenant Commander, United States Navy
B.S., St. Bonaventure University, 1972

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

From the

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June 1983

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This thesis investigates the manpower alternatives for accomplishing the duties required of a Navy Drug Detector Dog (DDD) handler. The feasibility of substituting civil service or private sector contractor handlers for military handlers is examined to determine the least cost manpower alternative consistent with government requirements. Economic cost estimates for performing the DDD handler function are developed for each of the manpower alternatives. Manpower costs for the three alternatives are compared. Conclusions and recommendations concerning the staffing of DDD handler billets are provided.

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I. INTRODUCTION

The occupational structures of the military services have changed dramatically since the early days when the enlisted man served predominantly in non-specialized roles such as infantryman or "able-bodied" seaman. Modern military forces are characterized by a high degree of occupational specialization. The operating forces of today's military are sustained by an increasingly large support establishment. Many military personnel are engaged in a variety of support duties that parallel occupations in the civilian economy (Wool, 1968). In many cases these support functions can be performed more cost effectively by government civilians or through contracts with firms in the private sector. Employing civilians instead of military personnel in these support jobs can free the military members for duties in the operating forces. One support function where it may be possible to replace military personnel with civilians is that of the Drug Detector Dog (DDD) Handler.

A. RESEARCH OBJECTIVE

The objective of this thesis is to determine the most cost effective manpower alternative for accomplishing the duties required of a DDD handler in the Navy. The primary goal will be to identify the economic costs associated with employing military personnel, Federal government employees, or private sector contractors in the DDD handler duties. This cost data is essential information for decision makers who must choose among alternative allocations of limited resources.

B. CRITERIA FOR CHOOSING AMONG MANPOWER ALTERNATIVES

The primary criterion for choosing among the manpower alternatives available is the ability to meet the Navy's requirements for DDD handlers at the least cost to the taxpayer. This policy is established in Public Law 93-365 which states:

It is the sense of Congress that the Department of Defense shall use the least costly form of manpower that is consistent with military requirements and other needs of the Department of Defense. Therefore, in developing the annual manpower authorization requests to Congress and in carrying out manpower policies, the Secretary of Defense shall, in particular, consider the advantages of converting from one form of manpower to another (military, civilian, or private contract) for the performance of a specific job.

Before applying the least cost criteria, it is necessary to determine if the DDD handler function is required to be performed by military personnel. DoD Directive 1100.4 provides the following guidance:

Civilian personnel will be used in positions which do not require military incumbents for reasons of law, security, discipline, rotation, or combat readiness, which do not require military background for successful performance of the duties involved, and which do not entail unusual hours not normally associated with civilian employment.

When it is determined that a particular function is not required to be performed by military personnel, a decision must be made as to whether the function is governmental and, therefore, must be performed in-house. Finally, government agencies must conduct a cost comparison analysis to determine if the cost of performing the activity is lower using in-house government civilians or private sector contractors. Figure 1 presents a flow diagram which outlines the criteria decision makers must examine in deciding the appropriate manpower alternative.

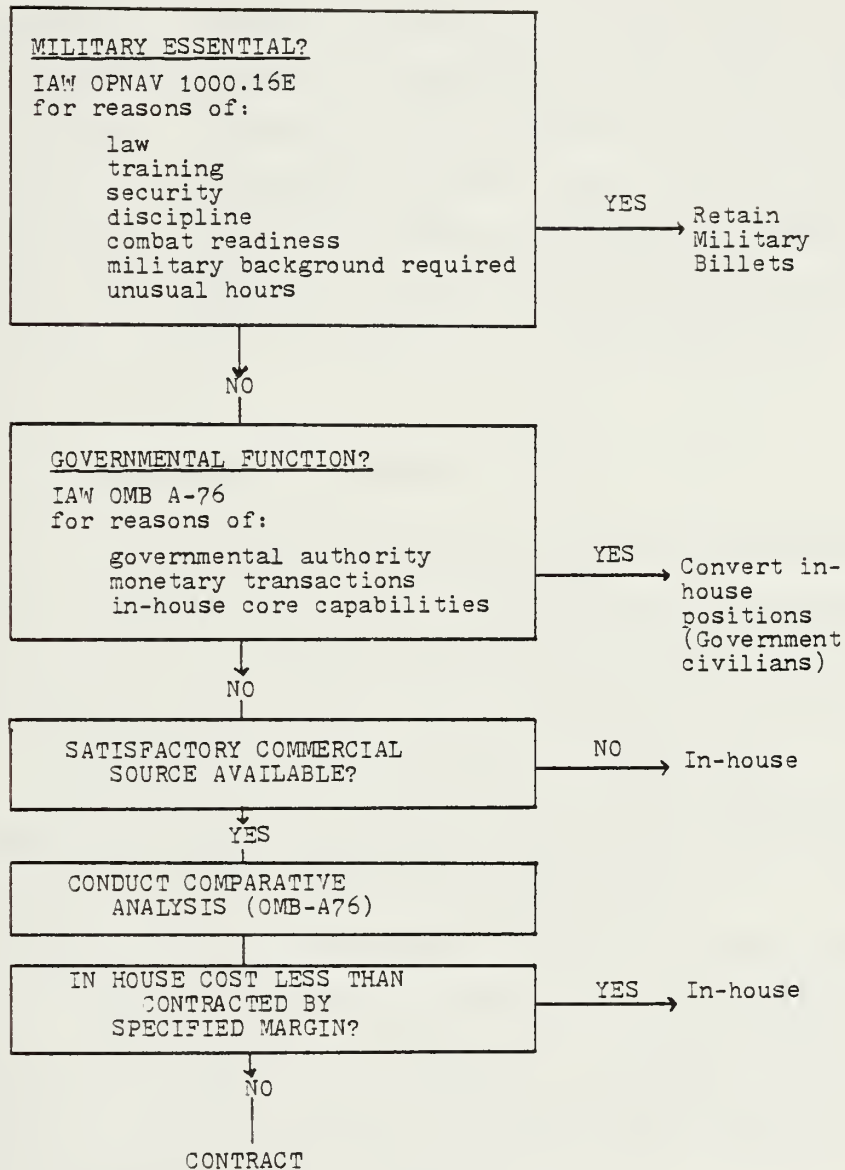


Figure 1.1 Criteria for Determining Manpower Alternative.

C. METHCDOLOGY, SCOPE AND LIMITATIONS

Costs of military personnel employed as DDD handlers are estimated using the 1983 revision of the Navy's Enlisted Billet Cost Model (EBCM). The Civilian Billet Cost Model (CBCM), 1981 edition, provides similar cost data for Civil Service employees. Ideally, contractor costs would be derived through evaluation of competitive bids from private sector ccntractors. However, it is beyond the scope of this thesis to develop a Statement of Work (SOW) which is necessary for soliciting firm bids from contractors. Therefore, cost estimates for ccntractors are estimated using data supplied through informal contact with representative private sector firms.

D. OUTLINE OF REMAINDER OF STUDY

Chapter II of this study describes the administration of the Navy's DDD program including the policies and procedures governing the program. Duties of the DDD handler are delineated and the training program for prospective handlers is described. The selection and training of DDD's is discussed. Procedures for utilization of drug detector dogs at the ccmmand level are outlined. Legal considerations governing the use of LDD teams are discussed.

Chapter III presents background data on the Navy source ratings which supply manpower for the drug dog handler requirements. The criteria for defining manpower requirements as military billets are examined. Estimates of the marginal costs of using military manpower from these source ratings are developed using the EBCM.

Chapter IV discusses topics relative to current and potential use of civil service personnel to fill drug dog handler psitions. Background information on dog handlers employed by the U. S. Customs Service and the Department of

the Navy are presented in order to determine the appropriate civil service series classification and grade levels required for Navy DDD handlers. The criteria for classifying a function as governmental are discussed in relation to the DDD handler function. The CBCM is used to estimate the economic cost of utilizing in-house civilian manpower.

Chapter V presents background information on the civilian market for drug dog handlers. Estimates of contractor costs for providing DDD handler services to the Navy are developed from non-competitive cost proposals supplied by three commercial sources. Potential problems which may preclude contracting are discussed.

Chapter VI presents estimates of the non-personnel costs associated with the operation of the Navy's DDD program. Costs for procurement, training and care of dogs as well as costs of maintaining dog kennels and support facilities are developed in the chapter.

Chapter VII compares the economic costs of staffing DDD handler billets with military, civil service and private source contractors.

Chapter VIII summarizes the conclusions and recommendations of this thesis relative to the most effective manpower alternative for staffing the DDD handler billets.

II. THE NAVY DRUG DETECTOR DOG PROGRAM

Dogs have been used by the U.S. armed services since World War II when the Army K-9 Corps was established. During and after the war, dogs were used primarily for sentry duties, guarding installations against enemy infiltrations. Since that time the use of dogs in the military has expanded to encompass a variety of types of military working dogs (MWD's). MWD's are defined as those dogs required by the armed forces for a specific purpose, mission or combat capability. Classes of MWD's currently used by the services include: scout, sentry, patrol, tracker, drug detector, explosive detector and mine and tunnel detector (DoN, 1971).

The Air Force Military Working Dog program was established in June 1958. Since 1972, The Department of Defense has assigned executive management responsibility for the MWD program to the Department of the Air Force. As the executive manager of the MWD program, the Air Force acts as a single point of contact for DoD on all matters pertaining to the procurement, training, and employment of MWD's, training of MWD handlers, and providing assistance in these matters to other federal agencies as necessary (DAF, 1980).

The Navy utilizes four types of military working dogs; patrol, patrol/narcotic, patrol/explosive, and drug detector. The Navy currently employs 289 MWD handler teams. A MWD handler team consists of a handler and a specifically assigned dog. Table I illustrates the Navy MWD program inventory of April 1983. Row totals indicate the number of MWD teams of a given type that are currently employed. For each MWD type, the number of associated handlers are displayed according to manpower source: military, U.S. civilian, or foreign national.

TABLE I
The Navy MWD Program Inventory (April 1983)

Type Dog	Manpower Category of Handler			Total
	Military	U.S. Civilian	Foreign National	
Drug Detector	140	24	1	165
Patrol	-	6	91	97
Patrol/Narcotic	17	1	6	24
Patrol/Explosive	3	-	-	3
Total	160	31	98	289

Source: Enlisted Community Manager for Master-at-Arms Rating.

Nearly half of the Navy's MWD assets are accounted for by the drug detector dog category. Also, the vast majority of handlers in this category are military personnel. It is for these reasons that this thesis concentrates on the Navy's Drug Detector Dog program.

A. BACKGROUND

OPNAVINST 5350.4 entitled "Substance Abuse Prevention and Control" provides detailed policy guidance on substance abuse including detection and deterrence aspects. The deleterious effects of substance abuse on military discipline and readiness are recognized in the following quote from this instruction:

Drug and alcohol abuse is costly in terms of lost man hours and unnecessary administrative and judicial processing and is a critical drawdown on morale and esprit de corps. It undermines the very fiber of combat readiness, safety, discipline, judgement, and loyalty. Zero tolerance recognizes that drug and alcohol abuse is incompatible with the maintenance of high standards of performance, military discipline, and readiness and is destructive of Navy efforts to instill pride and promote professionalism.

The Navy's Drug Detector Dog (DDD) program is one of several programs designed to deter the incidence of drug abuse. EUPERSINST 10570.1A, entitled the "Navy Drug Detector Dog (DDD) Program," describes the purpose of the program as follows:

The use of detector dogs increases the probability that illegal drugs will be detected and significantly reduces the time and manpower required to thoroughly search an area suspected of harboring illegal drugs. In addition, DDD teams pose a significant psychological deterrent to the introduction of drugs aboard ships, aircraft, or shore installations.

The Navy has authorized 158 billets for DDD handlers. (The DDD handler billet structure is discussed in detail in Chapter III). Appendix A lists the seventy-six Navy activities and one Air Force activity authorized DDD teams. Of the seventy-five Navy activities authorized DDD handler billets, fifty-eight are at shore duty stations and seventeen are aboard ships. The future status of DDD teams aboard ships, however, is uncertain. Preliminary evidence indicates the DDD's are not adapting well to the shipboard environment. The Navy has requested that the Air Force Animal Studies Branch, Lackland AFB, conduct a study to determine the feasibility of further shipboard employment of DDD's (Zullo, 1983).

In November 1982, the Naval Investigative Service (NIS) assumed the role of MWD program manager for the Navy. In this role NIS is responsible for: monitoring the DDD program

and evaluating team field operations; reviewing and processing requests for training of DDD teams, including screening of applicants; acquiring and assigning quotas for the dog handling course; and providing funding for procurement of canines.

B. SELECTION, DUTIES AND TRAINING OF HANDLERS

Due to the high level of reliability required of personnel handling dangerous drugs, prospective DDD handlers must be carefully screened to insure selection of the most qualified candidates. BUPERSINST 10570.1A provides the following criteria to be used in the selection of applicants for handler training:

1. Be a volunteer with a strong desire to work with canines.
2. Possess a mature attitude and strong motivation towards this program.
3. Be one of the following in preferred order of selection:
 - a. Civilian security employee.
 - b. Military personnel in pay grades E-3, E-4, E-5.
4. Exhibit good coordination and be physically fit, with normal color perception.
5. Must not have claimed or been granted drug exemption, and must have an offense-free disciplinary record for the preceeding two years.
6. Have a valid government driver's license.

NIS, as MWD program manager, has recently proposed a revision to the handler eligibility requirements specified in BUPERSINST 10570.1A. Their revised eligibility criteria (the same as those proposed for conversion to the MA rating) tighten the disciplinary and performance standards required of DDD handler applicants. For instance, applicants must have no record of conviction by courts martial or civil court, except for minor traffic violations, for the past fifteen years and no record of non-judicial punishment for the past five years. Personnel in these positions also will be expected to demonstrate an overall performance in the top ten percent on the enlisted evaluation (Radigan, 1983).

The duties required of a DDD handler are not currently defined in the occupational standards of any Navy enlisted rating. The DDD handler billets are considered general/administrative billets which require only the military skills or experience of a given paygrade and may be authorized for any rating (DoN, 1981). A more complete discussion of source ratings of DDD handlers is given in Chapter III.

The DDD handler billets are assigned the 9542 Navy Enlisted Classification Code (NEC) which is used to identify special knowledge and skills not included in the enlisted rating structure. Billets coded with the 9542 NEC for Drug Detector Dog Handler require the incumbent to perform the following duties:

Perform specialized duties in the detection of illicit drugs within the military community utilizing a drug detector dog. Performs military customs inspections. Responsible for the care, welfare and continuous training of assigned dog to ensure physical condition and proficiency are maintained. Possesses working knowledge of the legal aspects of search and seizure and preservation of evidence. Is proficient in the identification of illicit drugs. Prepares written reports, evidence vouchers, and initiates evidence chain of custody documents (DoN, 1980).

In order to qualify for the 9542 NEC, military personnel must complete the Drug Contraband Detector Course conducted by the 3282nd Technical Training Squadron, Air Force Military Training Center, Lackland Air Force Base, San Antonio, Texas. In this course, currently 10.8 weeks long, students acquire the knowledge and skills necessary to use their dog in drug detection. Each student is paired with one or more dogs which the student will work with throughout the course of training. Students learn how to care for and maintain the dog, kennel, and associated equipment. The student also learns the principles of dog conditioning and trains the dog to respond to the handler's commands. Students also receive classroom instruction on drugs of abuse, drug smuggling methods and procedures for search and seizure. The modal grade for all service members in the Drug Contraband Detector course is E-5. Ninety-six percent of all students enrolled complete the course (Baron, 1983).

It is anticipated that the current 10.8 week course will be shortened to approximately five weeks beginning in the summer of 1983. This reduction in course length will be achieved through the initiation of a "green dog" training program wherein the dogs will be pre-trained in basic obedience and drug detection skills prior to their participation in the drug detector course. Previously trained handlers attached to the dog training center will be responsible for this training. In this way, students in the drug detector course will be relieved of much of the basic dog obedience and conditioning training tasks (Parks, 1983).

C. SELECTION AND TRAINING OF DRUG DETECTOR DOGS

All dogs trained and used as working dogs are procured by the Department of Defense Dog Center (DoDDC) at Lackland AFB, Texas. Usually, only german shepherd dogs are accepted

for use but various small breed dogs have been used by the Air Force in special situations as narcotic detector dogs. Information on the selection and training of dogs discussed in this section is found in AF 125-5.

Dogs offered to the DoDDC must be between one and three years of age. Either male or spayed female dogs are acceptable. Dogs do not have to be pure bred or registered but must display the predominant characteristics of their breed. Shepherds must be at least twenty-three inches high at the shoulder and must weigh at least sixty pounds. Dogs must be in excellent physical condition but minor physical defects may be acceptable provided they do not impair the dog's ability to work.

The majority of dogs trained and used by the Air Force are donated by or purchased from the American public. Prospective MWD dogs may be screened through correspondence with their owners and later shipped to the DoDDC for further evaluation. Other dogs may be purchased locally in the San Antonio area or DoDDC personnel may travel to distant areas to evaluate and purchase dogs.

After dogs have been accepted for military use, they are matched with handlers and entered into narcotics detector courses. Dogs are trained first in basic obedience. Once dog and handler become acquainted, the drug detection training begins. The basic principle of this training involves establishing a conditioned response to a specific stimulus. Dogs are introduced first to the scent of drugs and motivated to seek out actively the scented article. When it makes a successful find, the dog is praised by the handler and then given its favorite play article. The dog then associates the pleasant event with the finding of the required substance. Such reward is withheld from the dog until, through repeated trials, the dog successfully alerts on the drug.

Dogs are trained to detect the odor of the following drugs: heroin, cocaine, marijuana, and hashish. In each case, the dog must: recognize the odor of the drug; actively search for the drug; pinpoint the location and give a positive response. Usually, the drug detector dog will be taught to bite and scratch at the hiding place when it locates the drug.

Dogs who successfully complete the training program are then certified by the MWD Studies Branch, USAF Security Police Academy, Lackland AFB, Texas. To achieve this certification, dogs must maintain a ninety percent accuracy rate out of a total of at least twenty trials.

At their new duty station, dogs will require continual reinforcement through proficiency training to maintain their skills. Through an arrangement with the Drug Enforcement Agency (DEA), eligible military activities may obtain samples of marijuana, heroin and cocaine to use as training aids in proficiency training. The amount of proficiency training required depends on the individual dog, but one hour per day is usually recommended. Dogs must be recertified upon reporting to their first duty station and four times a year from then on. A ninety percent accuracy rate is required for recertification.

D. PROCEDURES FOR UTILIZATION OF DDD TEAMS

When authorized DDD teams may be used in a variety of locations on military installations including the following:

1. Base entrances
2. Parking lots
3. Barracks
4. Work spaces
5. Aircraft and air terminals

6. Ships and boats
7. Brigs and correctional custody units
8. Schools (located on federal property)
9. Military postal facilities

OPNAVINST 5350.4 recommends that searches conducted for contraband include:

1. Gate and quarterdeck searches overseas.
2. Special searches of ship's boats used to transport working parties.
3. Searches conducted when there is probable cause to believe that an offense has been committed and that evidence will be discovered by the search (this includes probable cause searches of mail in the military postal system overseas).

This instruction also recommends employing drug detector dogs in a command's continuing program of health and welfare and military inspections to include:

1. Messing and berthing inspections.
2. Zone or material inspections (especially working and storage spaces).
3. Sea bag or locker inspections including inspections of newly reported personnel.
4. Gate and quarterdeck inspections in CONUS.
5. Random inspections of mail in the military postal system overseas.

When a commander, commanding officer, or officer-in-charge has reason to believe that drug abuse or trafficking exists in any area of his or her command, that individual may request the services of a DDD team. Specific details of procedures for requesting or utilizing the DDD teams may vary by location. A typical scenario for utilization will be described to illustrate how the DDD team operates. Details on the operation of DDD teams which are provided in the remainder of this section are taken from NAVSTAPPEARLINST 10570.1B entitled "Drug Detector Dog (DDD) Program."

Before the DDD team is used to conduct any searches or inspections, the commanding officer or other official having the authority to authorize searches should observe personally the DDD team's effectiveness. The commanding officer will normally witness a demonstration of the team and will be asked to plant various drug training aids in a specified area. The dog's successful detection of these drugs serves as evidence of the team's ability to locate the drugs in question. The commanding officer will also view the dog's training record as further evidence of its reliability. The commanding officer then certifies the DDD team in writing with a letter detailing the specifics of the demonstration. In addition to this initial certification, the commanding officer should periodically review the training and duty experience records of the dog.

To initiate the DDD inspection/search, most locations require some form of written request for authorization to utilize the DDD team's services. Normally, it is the commanding officer who requests the services thereby officially authorizing the operation. The request may specify a period of time during which the team's services will be used. A command representative may be designated as point of contact.

The DDD team handler may deal directly with the command representative for specifics on date, time, and location of the search once the search has been authorized. It is desirable to limit the number of personnel having prior knowledge of the inspection to the DDD handler and the commanding officer, executive officer, and command representative of the organization in question.

On the day of the inspection, the DDD handler team, sometimes accompanied by other security department personnel, will meet the command representative at the designated site. The command being inspected usually provides a minimum number of reliable petty officers who are briefed on the operation and detailed at each entrance and exit of the inspection site to provide security and prohibit entrance while the DDD team is conducting the inspection. The security detail will clear all areas to be inspected of non-essential personnel and will ensure that no one removes suspicious items from the inspection area. In addition to the security detail, the command may be required to supply an individual to act as recorder. The recorder accompanies the DDD team and the command representative to each area to be inspected and provides a written record of the proceedings.

The DDD team walks through the designated spaces, allowing the dog to use its keen sense of smell to locate hidden drugs. If the dog alerts, the recorder will mark the area with tape, making note of the alert number, date, time, location, and any other pertinent information. The team will then continue to inspect the remaining spaces. After all areas have been searched and all alerts documented, the DDD handler or the command representative will notify the commanding officer of the alert(s) and request authorization to search. Once authorization is given, the DDD handler or the command representative will conduct the search.

If illicit drugs are found they will be confiscated according to established procedures. During the inspection, the recorder maintains a log of all alerts using some local form which documents background information on the inspection and the DDD team and identifies each alert by time, specific location, item found and quantity. The form may also have a section, to be completed later, which will indicate the results of field tests or subsequent lab tests to be completed on the suspected drug. At the end of the inspection the original copy of this form will be given to the command representative for further action and a duplicate copy will be returned to the DDD team.

The local base security officer may provide field testing services for suspected drugs, and/or the substance may be sent to a designated lab for analysis. If the tests prove the substance to be an illicit drug, the commanding officer may initiate non-judicial punishment or court martial proceedings under the Uniform Code of Military Justice. The DDD team should be available to give testimony concerning their operations at any such proceedings.

E. LEGAL CONSIDERATIONS

In this section legal considerations relative to the use of DDD teams are discussed. The legal basis for the commanding officer's authority to order DDD inspections is outlined. A discussion follows concerning who may conduct an authorized search. Finally, conclusions are stated relative to the employment of military, civilian or contractor handlers in authorized searches.

According to U. S. Navy Regulations the commanding officer is charged with the responsibility for the safety, well-being, and efficiency of the entire command. These responsibilities include the health, welfare, morale, and

discipline of assigned personnel (DoN, 1973). The responsibility of the commanding officer for the command is absolute and authority is guaranteed by virtue of the commanding officer's rank or assignment.

With respect to the commanding officer's responsibilities regarding drug abuse, Navy Regulations states:

The commanding officer shall conduct a rigorous program to prevent the introduction, transfer, possession or use of marijuana, narcotics, or other controlled substances as as defined in these regulations.

The commanding officer may legitimately exercise authority by ordering inspections. The primary purpose of the inspection is to ensure security, military fitness, good order, and discipline. Inspections are defined in Analysis Rule 313(b) of the Military Rules of Evidence (MRE) as follows:

An inspection is an examination of the whole or part of a unit, organization, installation, vessel, aircraft, or vehicle, including an examination conducted at entrance and exit points, conducted as an incident of command, the primary purpose of which is to determine and ensure the security, military fitness, or good order and discipline of the unit, organization, installation, vessel, aircraft or vehicle. An examination made for the primary purpose of obtaining evidence for use in a trial by court-martial or in other disciplinary proceedings is not an inspection within the meaning of this rule (MCM, 1969).

However, inspections undertaken primarily for the purpose of detecting contraband are permissible. Contraband refers to property, such as illicit drugs, the mere presence of which is unlawful. According to Analysis Rule 313(b), MRE, contraband inspections require an additional bases to establish their legality. For instance, the command must determine that the possession of contraband would adversely affect the ability of a command to complete its assigned mission. According to Analysis Rule 313(b), MRE, the use of

illicit drugs represents a potential threat to military effectiveness, therefore illicit drugs fall into the contraband category. Contraband inspections are permissible provided there is a reasonable suspicion that such property is present in the command or provided that the examination is previously scheduled (MCM, 1969).

OPNAVINST 5350.4 recommends the use of dog teams in conjunction with inspections (DoN, 1982(3)). In the Manual For Courts Martial, the use of dogs is specifically sanctioned as a "natural aid" in conducting inspections. Dogs may also be used to detect contraband in a valid contraband inspection (MCM, 1969). Based on the information presented above, the author concludes that the primary purpose of the DDD teams is to serve as an inspection aid to assist the commanding officer in exercising the responsibilities of monitoring the health, welfare, and morale of the command's troops. The conclusion that use of the DDD teams is a support to an administrative inspection function, as opposed to a law enforcement function, is central to the analysis conducted in this thesis.

As discussed previously in this chapter, the DDD alert may be used to establish probable cause for a search. The reliability of the dog must be established in order for the commanding officer to establish probable cause for a search. The commanding officer must be duly notified of the alert and must grant authority for the search. Analysis Rule 315(d), MRE, discusses who may conduct a search.

Any commissioned officer, warrant officer, petty officer, non-commissioned officer, and when in the execution of guard or police duties, any criminal investigator, member of the Air Force security police, military police, or shore patrol, or person designated by proper authority to perform guard or police duties, or any agent of such person, may conduct or authorize a search when a search authorization has been granted under this rule (MCM, 1969).

The search incident to the DDD alert may be conducted by any authorized command representative, whether military or civilian. It is not required that the handler conduct the search, nor is the person conducting the search required to be a member of the military police, or in the case of the Navy, an individual in the Master-at-Arms rating. Civil service handlers in the guard or police series, then, may be authorized to conduct searches. This conclusion serves as a basis for further discussions in Chapter IV on the use of contractors for DDD inspections. Due to legal considerations, however, it may be preferable to require a military member, such as the command representative, to conduct the search incident to a DDD alert. This should not pose any significant problems since, as discussed in Chapter II, the DDD handler is usually accompanied by a command representative. Even if this is not the case, an authorized military member may be called in to conduct the search at the same time the handler notifies the commanding officer of the alert.

III. NAVY MILITARY DDD HANDLERS

This chapter begins with a discussion of the source ratings which provide personnel for DDD handler billets. The Master-at-Arms (MA) rating is discussed in depth since the majority of authorized handler billets are drawn from this rating. The authorization of handler billets from deprived ratings is also discussed. The DDD handler billets are then evaluated with respect to the military essentiality criteria. Finally, the EBCM cost elements are discussed and the economic cost of current mix of military DDD handler billets is developed.

In the Navy, personnel from a variety of ratings may serve as DDD handlers. Table II lists the authorized military DDD handler billets by rating and paygrade.

Approximately eighty-one percent of the 158 authorized DDD handler billets are from the Master-at-Arms rating. The remainder of the billets are designated for deprived ratings, i.e. ratings in which the time between normal shore or preferred overseas shore duty assignments exceeds three years. The majority of Navy DDD billets are authorized for paygrades E-6 or above. This follows, in part, from the fact that the MA rating, which comprises the majority of handler billets, consists only of paygrades E-6 through E-9.

The Navy's grade level distribution of handlers differs considerably from that of the other services. The Army, Air Force, and Marine Corps use Military Police personnel in paygrades E-3 through E-7 in their dog handler billets, with the majority of billets written for the lower paygrades. Handlers in these services are normally "close-looped" in their specialty, i.e. they serve repeated back-to-back tours as dog handlers, until they reach paygrades E-6 or E-7.

TABLE II
Authorized Navy Military DDD Handler Billets

Rating	E8	E7	PAYGRADE		E4	Total
			E6	E5		
Aviation Machinist				1		1
Boatswain's Mate				3	3	6
Engineman			9			9
Equipment Operator			1			1
Fire Control Tech		1				1
Gunner's Mate-Guns			4			4
Master-at-Arms	1	15	112			128
Machinist's Mate			1	1		2
Quartermaster				1		1
Ship's Serviceman			2	2		4
Torpedoman				1		1
TOTALS	1	16	129	9	3	158

Source: MA detailer's computer history of all authorized DDD (NEC 9542) billets (provided to author by NIS 5 April 1983).

At that point in their career, some of these handlers are assigned to billets as kennelmasters while the remainder are assigned to some other law enforcement duties (Parks, 1983).

A. THE MASTER-AT-ARMS RATING

The MA rating was established in 1973 to provide commands with personnel who could serve as technical advisors in the areas of law enforcement and physical security. The MA rating encompasses the following duties:

MA's perform, train, and advise appropriate personnel on matters of investigations, interrogations, apprehensions, crime prevention, preservation of crime scene and evidence, enforcement of appropriate orders and regulations, beach guard, shore patrol, physical security evaluations, crowd control, confrontation situations, brig operations, preparation of required records and reports; and such other duties as are appropriate for the organizational MA force (DoN, 1980).

The MA rating should be distinguished from the Master-at-Arms (MAA) force. The Standard Organization and Regulations Manual of the U.S. Navy (OPNAVINST 3120.32A) provides functional guidance on the formal delegation of authority by a commanding officer to subordinates of his command. Section 303.3 defines the duties of the Chief Master-at-Arms (CMAA) as "functions as the assistant to the executive officer in the enforcement of good order and discipline". The CMAA is responsible for organizing and training the MAA force; enforcing Navy Regulations, unit regulations, and pertinent directives; assisting the Officer of the Deck in the execution of ship's routine; and ensuring frequent inspections of the unit. The CMAA, or members of the MAA force, may belong to any Navy rating. In practice, it is desirable to have personnel in the MA rating serving as senior members of the MAA force.

The MA rating differs from most other Navy ratings in that it draws its members from other occupational specialties through lateral conversion. Billets for MA's are authorized only at paygrade levels E-6 through E-9. Personnel, who meet the eligibility requirements, may request conversion to the MA rating as an E-6 or as an E-5 eligible for advancement to E-6 (DoN, 1981(2)).

Table III depicts the breakdown of authorized billets, inventory strength levels, and inventory strength as a percentage of authorized billets for each MA grade. The authorized billets figure includes programmed billets for students, members in a transient, patient, or prisoner

(TP&P) status, or members recalled for temporary active duty (TEMAC), as well as the distributable billets.

TABLE III
MA Billet Authorizations Versus Inventories

GRADE	Billets Authorized	Inventory	Inventory as % Authorized
MACM	71	45	63
MACS	119	106	89
MAC	462	350	76
MA1	944	801	85
MA2	0	99	-
TOTAL MA	1596	1401	88

*Grade descriptions:

MACM - Master Chief Master-at-Arms
MACS - Senior Chief Master-at-Arms
MAC - Chief Master-at-Arms
MA1 - Master-at-Arms, First Class
MA2 - Master-at-Arms, Second Class

Source: Navy Enlisted Distribution Statistical Summary Report (MAPMIS 1306 - 4442 of 31 January 1983).

The inventory of MA's does not meet authorized end strengths for two primary reasons. First, highly qualified candidates from other critical ratings may not be permitted to transfer to this rating. Second, in the past, poor or incomplete screening of candidates for MA conversion sometimes resulted in the acceptance of undesirable personnel in the rating. These personnel did not meet the high standards of integrity required of MA's and were later reverted to their original rating (Radigan, 1983).

Information on the distribution of billets by sea and shore duty is also provided in the Manpower and Personnel Management Information System (MAPMIS) statistical summary report. The 31 January 1983 figures indicate that 760 of the 1509 distributable billets (TEMACs, students, and TP&P billets are excluded), or 50.4 percent, are designated as shore duty billets. The MA rating is currently described as shore intensive, i.e. the rating has shore billets in excess of the number needed to achieve the CNO 3:3 sea/shore rotation goal (C'Brien, 1983).

B. OTHER SOURCE RATINGS

Of the 158 authorized DDD handler billets, thirty are allocated to a variety of deprived ratings such as Boatswain's Mate, Engineman, or Machinist's Mate. As stated previously, deprived ratings are sea duty intensive ratings which do not meet the CNO rotation ratio goal of three years of shore duty for every three years at sea (DoN, 1981(1)). Assignment of personnel from these ratings to handler duties provides additional shore duty billets for these sea intensive ratings.

Many of the DDD handler billets (NEC 9542) are listed on Manpower Authorization Documents as Functional Area Code (FAC) "G" billets. FAC codes are used to identify billets requiring specialized consideration in personnel detailing. FAC "G" billets are defined by OPNAVINST 1000.16E as follows:

Billets in CONUS shore activities or preferred overseas shore duty activities which require only the military skills designated by the paygrade indicated. These billets will be managed by CNO to provide for sea/shore rotation opportunity for deprived ratings.

In practice, a higher percentage of personnel from ratings other than the MA rating are used in the DDD handler billets than the authorized billet distribution indicates. For example, a list of the inventory of DDD handlers effective 5 April 1983, indicated that seventy-nine of the 125, or sixty-three percent of the military handlers at that time were members of ratings other than the MA rating (Zullo, 1983). Differences in rating distributions of actual DDD handler inventories compared to authorized handler billets may be due to a variety of reasons. For example, shortages in the MA inventory may necessitate the use of other ratings, usually deprived ratings, in these billets. Another reason may be due to the practice of commands using "out-of-hide" resources to fill a DDD handler billet. In this case, commands lacking authorized DDD handler billets may choose to train and employ as DDD handlers personnel who were detailed to their command to fill other authorized billets.

Since assuming program sponsorship for the MA rating, NIS has proposed expanding the MA paygrade structure to include paygrade E-4 and E-5. This would permit utilization of E-4 and E-5 MA's in the DDD handler billets, as is the case for military handlers in other services. In accordance with procedures outlined in OPNAVINST 1000.16E, however, before rating expansion occurs, the manpower requirements for MA personnel in the lower paygrades first must be validated. In doing this, manpower planners must substantiate that certain billets require the unique skills and experiences which could be expected of personnel in lower paygrades of the MA rating. If, however, these billets require only general petty officer skills, which are not unique to any rating, the billets should not be converted to the MA rating. Another consideration concerning rating expansion involves compensation for the MA billets.

Because military end strengths are tightly constrained, expansion of MA requirements would probably require compensating with billets from other ratings. Billet trade-offs are an important consideration in MA rating expansion since for every MA billet created, another rating will lose a billet authorization.

C. MILITARY ESSENTIALITY

Having presented background information on the Navy ratings authorized in the DDD handler duties, it is now necessary to determine whether or not these billets do require military personnel.

Several criteria must be considered in differentiating between military and civilian manpower requirements. A listing of the reasons for classifying a valid manpower requirement as a military billet is found in DoD Directive 1100.4. These reasons are also reiterated in OPNAVINST 1000.16E. When a decision is made to designate a billet as military, a military essentiality code (MEC), denoting the reason for military staffing, should be assigned to the billet. Appendix B lists the MEC codes.

The author interviewed a Manpower Analyst to determine what MEC codes currently are assigned to the DDD handler billets (Brand, 1983). MEC codes are listed in Block 29 of a command's manpower authorization. Discussion with the analyst revealed that central retrieval of this type of information is difficult. Hence, it was decided to review the manpower authorization of two major locations having DDD's: Naval Station Pearl Harbor, HI (6 billets) and Naval Submarine Base, Bangor, WA (8 billets). Neither of these locations indicated an MEC code for the DDD billets. Although it cannot be stated with certainty that none of the DDD handler billets are coded as military essential, the

limited data available suggests that the MEC codes may not be assigned in many cases.

The official guidance requires that manpower requirements shall be defined as civilian positions if there is no valid reason for justifying the military requirement, and provided that these duties normally can be performed by civilians. In the following paragraphs, each of the criteria for classifying manpower requirements as military are discussed as they apply to the DDD handler billets.

1. Law

The author could find no federal law or regulation which mandates that DDD handler billets must be filled by military personnel. Both civil service personnel and contractors are used in a variety of security functions. Civil service personnel also serve in law enforcement functions include serving as investigators with NIS. Employment of civilians in these security and law enforcement roles suggests the absence of any law which would prevent the use of civilians in DDD handler billets.

2. Training

The training criteria for classifying a billet as military would apply if the skills and knowledge required in a billet are primarily acquired through military training or experience. This criterion implies that the training must be militarily oriented in nature as opposed to training that could be acquired in the civilian sector. The initial skills and knowledge required of a DDD handler are normally acquired through the training provided in the Air Force Drug Contraband Detector Course. This course is available to both military personnel and DoD civilians. Furthermore, there are several civilian agencies that train drug dog handlers (see Chapter V). While it is true that DDD

handlers in the military are required to learn certain military regulations and procedures in addition to dog handling techniques, this alone, in the author's opinion, does not provide sufficient justification for classifying these billets as military.

3. Security

The DDD handler does not require access to classified information, per se, in the performance of his duties (DoN, 1980). However, handlers sometimes require access to classified areas on ships or shore stations for the purposes of conducting inspections in those spaces. Civilians can be granted Secret or even Top Secret security clearances for this purpose. Frequently, Security Guards or Police Officers require Secret clearances to qualify for their positions. Hence, security reasons should not prohibit the use of civilians in these billets.

4. Discipline

Use of military personnel in billets on board brigs or correctional custody centers, for instance, is justified by reason of discipline. In the author's estimation, any argument for classifying DDD handler billets as military solely for reasons of discipline would be weak since handlers are not directly involved in disciplinary duties.

5. Combat Readiness

Billets which are in direct combat or direct combat support functions are classified as military by reason of combat readiness. One could argue that the use of DDD handlers in wartime is necessary to limit drug abuse. DDD handler billets aboard ships could be viewed as military essential since handlers would serve in a combat environment. It would be difficult to substantiate, however, that

a DDD handler billet, even on board a ship, is essential to combat readiness. Also, one could argue that DDD handler billets at shore activities are a direct combat or direct combat support function. The justification for such an argument would be even more difficult to substantiate than that for a combat or shipboard environment.

From a manning point of view, it could be argued that DDD handler billets represent a "surge" capability for mobilization. Air Force or Army manpower managers may argue, for instance, that there is justification for their fairly large peacetime military police forces in that these personnel can provide a trained mobilization base in wartime. These services require large numbers of military police to monitor mobilization efforts such as the transport of troops and supplies to overseas locations. As previously indicated (Section A of this chapter) the Navy's MA rating inventory, on the other hand, is relatively small compared to military police forces in other services. The needs of the Navy do not support a large "military police" mobilization force (Cahill, 1983). Justifying military DDD handler billets as mobilization "surge" billets therefore, does not appear reasonable.

6. Military Background

Billets may be classified as military essential when a military background is required for successful completion of the duties involved. Examples of billets where military background may be justified are recruiting billets and certain billets at recruit training commands. In these cases, the military member serves as a role model for potential enlistees or recent recruits. While a military background may be useful in certain aspects of the DDD handler's duties, it is not required for successful performance of these duties.

7. Working Hours

Billets may be classified as military essential when personnel are required to work unusual hours in the performance of their duties. DDD handlers work primarily on day shifts. However, depending on the size and type of command, they may be required to perform inspections during other than normal working hours on an occasional to frequent basis. There are several examples, however, where civil service personnel are required to perform overtime work on an irregular or occasional basis. Civilians in Public Works Departments, for instance, may be requested to work overtime. For installations requiring several dog handler billets, it may be possible to have civilian DDD handlers working various work shifts to accommodate user's needs. In any case, the requirements to provide premium pays or night-shift pay differentials should be viewed, in this case, as an economic consideration but not a requirement, in itself, for making a billet military essential.

8. Rotation/Career Progression

Rotation or career progression are not specifically mentioned among the basic seven criteria for defining billets as military essential. However, OPNAVINST 1000.16E, Article 503.2, states that:

Shore billets...which have been coded for either military or civilian incumbents may be classified as military requirements if they are needed to achieve CNO sea/shore rotation goals. Otherwise, these billets/positions will normally be classified as civilian requirements.

As previously discussed, the MA rating is presently designated as shore intensive. The DDD handler billets authorized for MA's are not required for the purpose of providing shore duty billets for MA's. If this function

were civilianized, presumably MA's could be utilized in other shore billets. DDD handler billets, however, do provide shore duty billets for a variety of deprived ratings. However, civilianizing these positions would have minimal impact on sea/shore rotation in most of these ratings since so few DDD handler billets are involved in any one rating as shown in Table II.

Career progression in the MA rating or in the deprived ratings would not be affected by civilianizing the DDD handler billets since skills and knowledge required in this job are not part of the qualification standards required for advancement in these ratings (DoN, 1980).

D. COST ELEMENTS IN THE ENLISTED BILLET COST MODEL (EBCM)

The initial structure and format of a data base for the Enlisted Billet Cost Model (EBCM) were developed by the Secretary of the Navy's Task Force on Personnel Retention in 1966. Since that time, the model has been refined further and adjustments have been made in response to changing data sources, formats, and availability. Changes in the model have also resulted as the outgrowth of several years of research in manpower cost analysis.

The 1982 edition of the EBCM (Frankel, 1982), supplemented by Fiscal Year (FY) 1983 cost data, was used in estimating the cost of military DDD handlers. The EBCM computes the cost of manning Navy billets with personnel having requisite ratings and paygrades. The EBCM is intended to facilitate resource allocation decisions by modelling the marginal cost (rather than the annual budgetary cost) of a given billet. The EBCM takes into account not only the yearly budget cost of a person qualified to fill a given billet, but also the cost of keeping the billet continuously filled. That is, in providing for full-time

staffing for a given billet, manpower planners must program additional billets to account for the personnel that can be expected to be in a transient, patient, prisoner or student status at any given time. EBCM FY 83 data for all authorized DDD source ratings are presented in Appendices C through M. The EBCM cost elements are briefly described below.

1. Basic Pay

This cost element reflects the annual base pay or salary paid to the service member based on the individual's paygrade and length of service (LOS). The EBCM uses the average LOS for each paygrade in the rating to derive the basic pay figure. Also included in this category are FICA contributions to the Social Security system that the Navy, as an employer, transfers to the U. S. Treasury.

2. SRB

The Selective Reenlistment Bonus (SRB) cost element provides an estimate of the average present cost of the SRB program for the rating.

3. Proficiency

This cost element contributes to the cost model a per capita average of all proficiency pays received by members of the rating by paygrade.

4. Hazard

The EBCM cost element provides a per capita average of all hazard pays received by members of the rating. Examples of hazard pays include flight crew and flight deck pay, and submarine crew pay.

5. Sea

The Sea Pay cost element is based on a per capita average of all sea pays received by members of the rating by paygrade.

6. VHA

The Variable Housing Allowance (VHA) cost element allocates a per capita average of the VHA received by members of the rating. The VHA supplements the Basic Allowance for Quarters (BAQ) for members living in a geographical location where the cost of housing exceeds the member's BAQ by at least fifteen percent.

7. Allowances

The EBCM cost element is a catch-all for all other allowances such as Basic Allowance for Subsistence (BAS) and Basic Allowance for Quarters (BAQ). The real cost includes both actual payments made and estimates of the cost of provisions made "in-kind," such as government housing or messing.

8. Retirement

Although retirement costs are not a direct cost to the Navy, this cost element captures the present value of expected future government economic obligations for military retirement. Included here is the cost of non-disability retirement, the largest part of this element, as well as disability retirement, severance costs and death payments.

9. Separation

This cost element includes the permanent change of station (PCS) costs, separation pay, and unemployment benefit costs generated by those projected to leave the Navy in FY 1983.

10. Accession

This cost element recognizes recruitment, initial clothing, and training costs which are totalled and amortized over the first enlistment.

11. Initial Training

In the EBCM cost element, the marginal economic cost of the expected initial school training for the rating is amortized over the expected useful life of the training.

12. Advanced Training

The Advanced Training element recognizes the amortized value of expected "C" school, and other advanced training costs.

13. Undistributed Costs

This basic cost element recognizes those costs which are not considered to be rating-specific but which should be allocated among all ratings by paygrade. Examples of Undistributed Costs include medical costs for military personnel and costs for the Civilian Health and Medical Program for the Uniformed Services (CHAMPUS) for dependents. Also included are the cost of regular (PCS) moves and other such general costs which were not previously collected in other cost elements.

14. Cost Totals

The Navy Billet Cost is the total of the thirteen direct cost elements. It represents the cost of a billet, assuming no unproductive time.

Unproductive Time Cost represents the opportunity cost of lost productivity due to time not worked. This includes the cost of "non-operational" time personnel may

spend in a transient, patient, or prisoner status or on leave or taking holidays. Time lost due to formal training is not included here.

The Navy Manyear Cost is the sum of the direct cost elements (Navy Billet Cost) and the Unproductive Time Cost. It is the total cost to the Navy of having the billet filled year round. The Navy Manyear Cost is the appropriate cost figure to use when comparing military billet costs with civilian contractor costs since contractors estimate their costs on a standard manyear of 2080 hours (40 hours a week, 52 weeks a year).

The Extra Hours Value is the economic value to the Navy of requiring sailors to work more than a standard manyear of 2080 hours. Navy manpower policy recognizes that sea duty demands more than a normal eight hour day and five day week. OPNAVINST 1000.16E promulgates Navy workweek standards to be used in the calculation of manpower requirements. Navy standard workweeks express the total hours available to accomplish the required workload. The standard workweek for ship's company personnel at sea is 74 hours for a watchstander and 66 hours for a non-watchstander. For aviation squadron personnel at sea the standard workweek is 70 hours, while the standard workweek for Navy personnel ashore is 40 hours. Statistics on the sea and shore distribution of each rating's incumbents (by paygrade) are used to determine, on the average, how many hours over 2080 that the members of the rating are expected to work. An economic value is then assigned to these extra hours and this value is captured in the Extra Hours Value cost element.

The Standard Manyear Cost is derived by subtracting the Extra Hours Value from the Navy Manyear Cost. This cost element would represent the cost of a sailor to the Navy if all sailors, whether on sea or shore duty, were required to work only the standard 2080 hours a year. The Standard

Manyyear Cost would be used in comparing the cost of a military member in a sea duty billet to that of a civilian contractor. However, the Navy Manyear Cost is a more appropriate cost to use in comparing a military member on shore duty with a civilian contractor since the former is assumed not to generate an Extra Hours Value.

15. Analysis of Work Hours

The Productive Manhour Rate is the real cost of an hour's work in the billet. It is found by dividing the Navy Billet Cost by the Productive Hours.

Productive Hours are the hours a year an individual actually delivers to a billet.

Unproductive Hours is the time an individual is either sick, on leave, or taking holidays. By multiplying the Unproductive Hours by the Productive Manhour Rate, one arrives at the Unproductive Time Cost (slight differences in the reader's computation of the Unproductive Time Cost element may occur due to rounding of the Productive Manhour Rate to only two decimal places).

Navy Billet Hours is the sum of Productive and Unproductive Hours and represents the number of work hours the Navy demands from a sailor. The Navy Billet Hours multiplied by the Productive Manhour Rate gives the Navy Manyear Cost.

The hours over 2080 are the extra work requirement that the Navy places upon a sailor over the standard work year. Multiplying this figure by the corresponding Productive Manhour Rate yields the Extra Hours Value cost.

E. MILITARY BILLET COST OF DDD HANDLERS

The cost of currently authorized military DDD Handler billets was calculated by multiplying the Navy Manyear Cost for each paygrade within a rating by the number of DDD billets authorized for that paygrade/rating. Appendix N presents these cost computations.

The current EBCM cost of the authorized DDD handler military billets is \$5,253,872. However, the cost of training is underestimated in the EBCM since the cost of the Drug Contraband Detector Course was not included in the model. Therefore, a cost for the DDD handler training must be included in the military billet cost calculations. Since the course length will be decreased from 10.3 weeks to five weeks in the summer of 1983, training costs will be developed based on a five week course length.

Appendix O presents the FY 82 Variable Training Costs per student week and per graduate for the Drug Contraband Detector Course (Baron, 1983). Direct Cost elements include those costs directly associated with the operation of the school including staff pay and supplies. Indirect Cost covers variable costs for relevant base support functions. Student Costs include costs for pay and allowances for the student while attending the school. Travel and per diem costs are also included in this category.

Based on a five week course length, the unadjusted variable cost of training per graduate is \$2667. However, these FY 82 figures must be adjusted to reflect FY 83 costs. Military pay and allowances totalling \$385.23 have been increased by four percent to reflect the FY 83 military pay raise. Civilian pay required no adjustment since there was no federal civilian pay raise in FY 83. Other cost components were inflated using a projected estimate of the FY 83 Personal Consumption Expenditures, Services (PCES) deflator index (DRI, 1983).

The PCES index is a general index covering consumer purchased services such as transportation, food, clothing, and medical care. The index provides a standard for comparing consumer costs for these services from one year to another. The PCES index of 1.09 was used to inflate FY 82 travel, per diem, and non-personnel costs which totalled \$139.12. After completing these cost adjustments the FY 83 grand total cost of training, per graduate, is \$2806.65.

In order to estimate the total annual cost of DDD handler training, it is necessary to determine the number of students that must be trained each year to replace outgoing handlers. If it is assumed that, in the "ideal" steady state system, all 158 authorized handler billets are continually filled, then additional billets must be programmed for students undergoing DDD handler training. The number of student quotas required each year for the DDD handler training course depends on the annual turnover rate of military handlers. In order to determine annual military handler turnover rates, some assumptions must be made regarding: the basis for determining turnover rates; tour lengths of handlers; and the policy for re-touring personnel in DDD handler billets. First, it is assumed that turnover rates are based on authorized handler billets instead of current handler billet inventories. Current inventories of handlers may fluctuate daily and may include several personnel not serving in authorized DDD handler billets. Since authorized billets are the only ones funded in the budgeting process, only these billets are examined. Second, it is assumed that all handlers complete their full authorized shore tour in the DDD handler assignment. Tour lengths for all MA handlers are assumed to be three years while tour lengths for all other handlers are assumed to be two years. However, handler turnover may occur more frequently than expected. Handlers in non-authorized billets in particular

may serve only a year or less in an assignment upon completion of training. This may be due to improper screening of handlers or to a command's desire to acquire a trained handler using onboard personnel, serving in other authorized billets, who have already completed part of their shore tours. Third, it is assumed that handlers serve only one tour in the DDD handler billet. DDD handlers, in some cases, may be given second tours in DDD handler billets. However, very few handlers are retoured in these billets at present. Therefore, the effects on handler turnover rates are not considered in these calculations.

Assuming that the 128 authorized MA handlers generally serve a three year shore tour, it would be expected, under ideal conditions, that approximately forty-three MA handlers would be trained per year ($128 / 3 = 42.67$). The remaining thirty authorized handlers from deprived ratings serve two year shore tours, therefore, fifteen additional handlers from these ratings would be trained each year ($30 / 2 = 15$).

Based on this ideal student programming load, fifty-eight students would be trained annually at a total cost of \$162,786. The total annual cost of authorized Navy DDD handler billets is summarized in Table IV.

TABLE IV
Annual Cost of Authorized Navy DDD Handlers

EBCM Cost for 158 Billets	\$5,253,872
Training Costs for 58 billets	162,786
Annual Cost of Military Billets	\$5,416,658

IV. CIVIL SERVICE STAFFING OF DDD HANDLER BILLETS

Before the economic cost of staffing DDD handler billets with civil service employees can be established, first it is necessary to determine the qualifications and skill requirements desired for Navy civil service handlers. Precedence for the employment of civilians as DDD handlers exists in the U.S. Customs Service and, to a limited extent, in the Department of the Navy. In this chapter, these civil service handler positions are examined and assumptions are presented concerning the appropriate civil service series classification and grade level for Navy DDD handlers. The issue of governmental function is addressed. Economic costs for the civil service staffing of DDD handler billets are then computed.

A. U.S. CUSTOMS SERVICE CANINE ENFORCEMENT OFFICERS

The U. S. Customs Service began using drug detector dogs on a wide scale in 1970. In FY 82, Customs employed 85 canine enforcement teams consisting of a dog and a Canine Enforcement Officer (CEO). Canine enforcement teams are used to interdict narcotics being smuggled through border ports and major gateways to this country. Teams are assigned to international airports, seaports, and border patrol points where they screen aircraft, cargo, baggage, mail, ships and vehicles (DoT, 1982).

CEO's are recruited for the Customs Service by the U.S. Office of Personnel Management (OPM) at the GS-5 level and advance to GS-7 and GS-9 as they acquire experience. The modal grade for CEO handlers is GS-9 (Chowning, 1983).

The CEO position is classified in the Customs Inspection Series, GS-1890 (OPM, 1978). Although there is no specific civil service code (CSC) for the CEO position, a review of civil service position descriptions (PD's) indicated that this position may be classified as CSC 1896, Border Patrol Agent, or more frequently, CSC 1899, Miscellaneous Inspection.

A summary of CEO duties, as described in the PD narrative, is as follows:

1. Enforces the Customs laws and those of other federal agencies and the corresponding criminal codes, and apprehends suspected violators of these and related laws enforced by Customs.
2. With the use of his detector dog, screens luggage, freight, and mail for the interdiction of dangerous drugs and conducts searches of vehicles, vessels, and aircraft.
3. Apprehends and searches suspected smugglers, makes seizures of contraband, and initiates chain of custody documentation for evidence (DoT, 1980).

The PD defines the work environment of the CEO as one of high risk, where the incumbent is subject to potentially dangerous situations. The CEO, who is frequently responsible for custody of narcotics with a high "street value," is subject to bodily harm. He may work under dangerous environmental conditions, such as on oily ship surfaces, and may come in contact with toxic chemicals in the course of his duties. The CEO's work involves long, irregular hours including rotating shifts, weekends, Sundays, and holidays. The CEO is subject to twenty-four hour a day recall and is frequently required to travel in support of special law enforcement efforts.

The CEO is primarily a law enforcement officer with special training and responsibilities with regard to the seizure of contraband. The CEO works independently, with the assistance of his dog, and has the authority, by virtue of his position, to search and seize contraband and can arrest suspects if the situation warrants. The CEO represents one example of a federally employed DDD handler who is a skilled law enforcement agent (DOT, 1980).

B. NAVY CIVIL SERVICE DDD HANDLERS

Currently, there are at least sixteen civil service employees serving as Navy DDD handlers. Appendix P lists the location and grades of these handlers (Zullo, 1983).

Discussions with handlers at several of these locations, revealed that the civilian DDD handlers are usually classified in either the Guard Series, CSC 085, or the Police Series, CSC 083. In most cases, these civilian handlers were hired originally to perform general guard or police duties. When their command recognized a need to establish a civilian DDD handler position, they volunteered for the program and were trained in the Air Force's Drug Contraband Detector Course (Croft, 1983).

Civil service employees may work full or part-time in the DDD handler duties. Mr. Croft, a GS-6 Supervisory Police Officer at NAS Jacksonville, Florida, has worked as a dog handler at his command since 1978. He stated that he works full time as a dog handler and kennelmaster. A PD supplied by Mr. Miller of the Norfolk Naval Shipyard, Virginia indicates that this GS-7, Guard Supervisor (Narcotic Detector Dog Handler) position, requires approximately thirty percent of the incumbent's time in the DDD handler function (NAVSHIPYD, 1983). Since precedence indicates that Navy DDD handlers are hired under the civil

service Guard or Police Series, it is necessary to describe the position classification procedures for these series in some detail. After establishing the need for a civilian manpower requirement, local commands classify the position according to civil service series and grade level. In general, the grade levels selected will depend on the nature and type of work assignments, level of supervisory responsibility, and basic knowledge, skills, and abilities required in the job.

Descriptions of the various civil service series are found in the Office of Personnel Management's Position Classification Standards (OPM, 1978). The Guard Series includes positions that involve performing or supervising protective services in guarding government buildings and property. Non-supervisory positions include grades GS-2 through GS-5 while supervisory positions, in the Guard Supervisory category, include grades GS-4 through GS-9.

A GS-2 guard is a trainee level employee, similar to a watchman, who is typically assigned to a stationary post or a walking post within a building. At the other extreme, GS-5 guards work more independently and are required to exercise a high degree of judgement and initiative in the conduct of their duties. Their duties may include enforcing a variety of laws, issuing warning and violation tickets, investigating accidents, or detaining violators.

In the Police Series, the police position includes grades GS-3 through GS-5, while the Police Supervisor position includes grades GS-5 through GS-9. Police positions are established primarily to enforce law and order, preserve the peace, and protect life and the rights of people. A GS-3 Policeman is the entry level position. Duties of the GS-3 might include conducting walking patrols, directing traffic, issuing traffic violation tickets, or arresting persons committing offenses. According to the OPM

standards, a GS-5 policeman deals with "difficult and complex police work requiring full knowledge and application of a complete range of police methods and service." Grades GS-6 and GS-7 may be detective positions where incumbents are engaged full time in the performance of investigative work. Supervisory Police Officers, GS-5 through GS-9, serve in positions where they are responsible for supervising and managing uniformed Police Officers.

Although there are many similarities between guard and police positions in the Federal service, guard positions exist for the purpose of protecting government property while police positions are established primarily for law enforcement duties. Most guards possess only the same arrest authority as a private citizen, although they may detain violators until the arrival of a law enforcement official. Police, on the other hand, are designated officially as law enforcement officers and can exercise arrest authority (OPM, 1978).

Under the present civil service classification system, it appears that the current practice of classifying civil service handler positions in either the Guard or Police series is acceptable. In this thesis it is argued that the Guard series may be more appropriate since the DDD handler does not require arrest authority in the performance of his duties.

As discussed in Chapter II, the duties required of a DDD handler should fall within the scope of the authority delegated by the command to civilian guards. Guards at most installations, for instance, may conduct random vehicle inspections as directed by higher authority. They may also perform certain types of searches and seizures when probable cause exists and when so directed. They may apprehend and detain personnel when there is reasonable belief that the individual has committed an unlawful act.

The grade level for the DDD handler position will depend on local requirements. Based on observation of current position classifications, it appears that the GS-5 grade level is appropriate for a non-supervisory handler while the GS-7 level may be utilized for handlers in supervisory positions, such as kennelmasters.

C. GOVERNMENTAL FUNCTION

Given that the DDD handler billets are not military essential, it is necessary to decide whether the handler billets should be considered governmental functions. According to OMB A-76, a government function is one which must be performed in-house due to a special relationship in executing government responsibilities. The Navy's Commercial Activities (CA) program, discussed in OPNAVINST 4860.6C, implements CMB A-76 (DoN, 1982(2)). This instruction prescribes that government functions fall into three categories:

1. Discretionary Application of Government Authority

This category includes investigations, prosecutions, and other judicial functions, and primarily is limited to those functions which inherently involve value judgements as opposed to ancillary or support activities. Other functions included in this category are those related to: direction of federal employees; contract administration; personnel management; and certain legal advisory activities.

2. Monetary Transactions and Entitlements

This category includes government benefit programs, tax collections, and revenue disbursements by the government. Functions associated with control of the public treasury, accounts, and money supply also fall into this category.

3. In-House Core Capability

This category includes functions in the area of research, development, and testing, needed for technical analysis and evaluations and technology base management and maintenance (DoN, 1982(1)).

As discussed in Chapter II, the role of the DDD handler is not considered to be a law enforcement function. The DDD team assists the commanding officer in conducting inspections the primary function of which are to ensure the health, welfare, and morale of the troops. The DDD handler function is not investigatory in nature and, therefore, does not require discretionary application of government authority. This function, as discussed in Chapter II, does not require monetary transactions or involve in-house core capabilities. For these reasons, the DDD handler duties are not considered governmental in nature. Therefore, they may be performed by contractors, provided that this alternative is the most cost effective choice.

D. THE CIVILIAN BILLET COST MODEL (CBCM)

The Civilian Billet Cost Model (CBCM) was developed to provide cost estimates associated with the creation and staffing of a civil service billet in the Navy. The CBCM is intended to be used when estimating the marginal cost of new or existing civil service billets or when estimating total costs of civil service employees either Navy-wide or for major subgroups.

The CBCM enables Navy decision makers to compare the cost of civilian billets with those of military or contract personnel in order to evaluate the cost effectiveness of these alternative labor forms. The Assessment Group, a Santa Monica, California based consulting firm, is currently under contract with the Navy Personnel Research

and Development Center to maintain and improve the CBCM. In refining the CBCM, Assessment Group analysts have attempted to maintain comparability with the cost measures found in the EECM (Butler, 1981). Although further research is necessary to completely satisfy this objective, the present CBCM model does provide users with a useful model for comparing civilian billet costs with those of military or contractor personnel.

In a study conducted by the Assessment Group, the authors compared the CBCM with the manpower cost analysis methods outlined in CMB Circular A-76 (Butler, 1981). A discussion of OMB A-76 guidelines can be found in Chapter V. The results of this analysis showed that the CBCM cost estimates differed from those produced by OMB A-76 procedures by only eight percent. The CBCM estimates were eight percent higher, according to the authors, because they were more complete than those using A-76. Butler further reported that "the CBCM would provide an increase in computational accuracy (as compared to OMB A-76 methods) at a lower marginal cost to the user (Butler, 1981)."

For the purpose of this study, the CBCM will be used to estimate the cost of civilian manpower instead of the OMB A-76 costing procedures. CBCM cost data for all major civil service occupational groups has already been developed and can be applied to manpower cost comparisons with a minimum of analytical effort. Development of OMB A-76 cost estimates would require several detailed cost studies and is therefore beyond the scope of this thesis.

E. COST ELEMENTS IN THE CBCM

The CBCM estimates civil service billet costs specified by grade and Functional Occupational Group (FOG). FOG codes developed for this model aggregate over 500 civil service

series covering both General Schedule (GS) white collar workers and Federal Wage System (FWS) blue collar employees into ninety-two occupational groups. In order to determine the appropriate cost model category to be used in the CBCM for evaluating DDD handlers first it was necessary to identify the applicable Civil Service Series code (CSC). Once the CSC category was determined, it was then cross-referenced in the CBCM FOG dictionary to a corresponding FOG group.

As previously discussed, the Civil Service Series most closely corresponding to the duties required of a government civilian DDD handler are the Guard series, CSC 085, and the Police series, CSC 083. Both series are aggregated by the CBCM into FOG 610, Fire and Police. All workers included in this FOG are white collar GS employees. Examples of other Civil Service Series included in FOG 610 include Fire Protection and Prevention, CSC 81, and Customs Enforcement Officer, CSC 1891.

For the purpose of this study FOG 610 is used as the appropriate group for developing DDD handlers' CBCM costs. Appendix Q lists the FY 83 annual billet costs by grade and by cost element for FOG 610, Fire and Police Group. The CBCM cost elements are described below (Butler, 1981).

1. Base Pay

Base pay in the CBCM is based on data obtained from the Navy Civilian Master File maintained by the Defense Manpower Data Center (DMDC), Monterey, California. Since civil service base pay is a function of both grade level and step, the base pay cost element averages base pay for all members of a given FOG by grade. The average base pay may vary among FOGs for the same grade level depending on the step distribution characterizing a given FOG grade.

2. FEGLI

This cost element represents the expected annual cost to the government for Federal Employee Group Life Insurance (FEGLI). Average salaries and percentages of individuals electing life insurance coverage are obtained from the Navy Civilian Master File for each FOG by grade level. The annual government contribution to the FEGLI program for each FOG/grade is then calculated according to procedures specified in the most recent edition of the Federal Employee's Almanac.

3. Retirement

This cost element estimates the net annual accrual of government obligations for civil service employee retirement benefits. It includes the cost of several forms of benefits administered by the Civil Service Commission, including a regular retirement policy, disability retirement, survivor policies, and lump sum settlements for those who elect to cash out of a policy at any time prior to receiving regular retirement benefits.

4. Training

This cost element includes the costs for tuition, travel and subsistence for training received by civil service employees. Courses may be provided by the employee's parent agency, some other government agency, or by an outside contractor or institution. Butler's analysis results suggested that government costs for training were significantly underestimated. Therefore, estimates of average tuition costs per hour were developed by the CBCM authors on the basis of typical contractor tuition costs since the authors felt that they more accurately reflect the actual resource costs involved in delivering a training

course. Data on duty hours spent training was derived from DMDC's Training and Master Files. In the case of the CBCM, training costs were considered current costs rather than investment costs as they were in the EBCM. Statistical analysis supported the Assessment Group's theory that, in the case of civilians, training represents a form of non-pecuniary income, and as such, should be considered a current cost rather than an amortized investment.

5. Premium Pays

This category includes special pays over and above base pay such as overtime, holiday and Sunday premiums, hazardous duty pay, and overseas or nightwork differentials. Data on premium pays was collected from a special analysis of distribution and number of premium hours worked by employees at representative Navy facilities. The Comptroller General of the Navy's Office (NAVCOMPT) provided additional data on total Navy expenditures in each of the premium pay categories.

6. Undistributed Costs

This cost element includes all other costs which cannot be allocated to a specific FOG or GS level and are therefore distributed equally among all Navy civilians. Examples of such elements include health insurance costs, severance costs, change of station costs, cost of unemployment benefits, overseas allowances, and suggestion or superior performance costs.

7. Recruitment

This cost element includes the recurring costs involved in filling a previously established civil service billet. Recurring costs include costs for advertising openings, interviewing applicants, and preparing formal offers.

Although the authors of the CBCM stated that recruitment costs should be included in the costing of civilian employees, they could find no existing data base to measure these costs. Estimates of recruitment costs, therefore, were based on information obtained from interviews with personnel officers at selected Navy installations. Although the recruitment cost data obtained by this method may not be exact relative to the absolute value, this cost data does provide a reasonable rough estimate of recruitment costs. Relative to other costs in the CBCM, the recruitment cost element values for FOG 610 are small and range from six dollars for a GS-2 to 109 dollars for a GS-12.

8. Annual Billet Cost

The Annual Billet Cost is the sum of the previous seven direct cost elements. It represents the cost of a billet, assuming no unproductive time. The Annual Billet Cost is comparable to the Navy Billet Cost element in the EBCM.

9. Downtime

This cost element recognizes the opportunity cost of the time for which civil servants are compensated but do not actually work. Sources of downtime include: holidays, vacations, sick leave, administrative leave, other earned leave, continuation pay, travel time and other non-productive time. The basis for downtime computations is the standard 2080 hour work year, corresponding to fifty-two forty hour weeks. This base is then adjusted by estimated downtime costs. Estimates of hours of annual leave downtime were based on rules governing annual leave earned at various lengths of service (LOS). The leave hour estimates were then applied to the known LOS distributions in the occupational groups. Other downtime costs were allocated equally among the occupational groups.

10. Standard Manyear Cost

The Standard Manyear Cost is the sum of the direct cost elements (Annual Billet Costs) and the Downtime Cost. It is the cost of keeping the position filled year round. The Standard Manyear Cost is comparable to the Navy Manyear Cost element in the FECM. The authors of the CBCM also indicate that the Standard Manyear Cost element is to be used when comparing civil service billet costs with contractor costs.

11. Initial Billet Cost

This cost element includes the additional costs involved in establishing a new civil service position. Initial costs include costs associated with preparing position descriptions or obtaining budget authorizations.

F. CIVIL SERVICE POSITION COSTS OF DDD HANDLERS

In order to calculate the cost of staffing all 158 authorized DDD handler billets with civil service personnel, it is necessary to know the GS grade levels for each of these positions. As discussed in Section B of this chapter, it is assumed that all future handler positions will be classified as grade GS-5 or GS-7. Although it would be expected that the majority of civilian handlers would be GS-5's, the exact paygrade mix cannot be determined. Therefore, the expected cost levels will be "bracketed" based on a least cost mix of all GS-5 handlers and a high cost mix of all GS-7 handlers.

As determined in Section D of this chapter, the annual marginal cost of the DDD handler is based on the FOG 610 series Standard Manyear Cost for the appropriate grade. According to the CBCM, an initial billet cost element should be included when a new civil service position is created.

This would be a one time cost and would not be included in the ccst analysis once the position has been established.

The start-up costs of creating 158 authorized civilian handler positions are calculated by adding the Standard Manyear Cost and the Initial Billet Cost found in Appendix Q for the grade level and multiplying this number by 158. The CBCM cost of the least cost mix (all GS-5's) is \$3,640,162, while the corresponding cost for the high cost mix (all GS-7's) is \$4,627,188. Recurring CBCM costs for civilian handler positions (Initial Billet Costs excluded) are \$3,575,224, for GS-5's and \$4,547,082 for GS-7's.

The ccst of the Drug Contraband Detector Training Course, however, must also be considered in the manpower costs since civilian handlers also attend this school. Since the author could find no data relative to the turnover rate of Guard or Police Series positions, a "worst case" situation will be assumed in which the civilian handler turnover rate is the same as military turnover. One would expect that civilians would remain in a handler position longer than the two or three year tour of their military counterparts. Hence, this assumption will result in an overstating of the cost of civilian handler training.

As in the case of military handlers, it will be assumed that fifty-eight civilians are trained annually in the model system. Assuming that all 158 authorized handler positions are continually filled, these trainees represent additional "pipeline" training billets that must be programmed to support the DDD handler billets.

In calculating training costs, the variable cost data presented in Appendix O was used with the exception of the pay and allowances cost element. A civilian pay cost was derived by multiplying the CBCM hourly wage rate for the appropriate grade (base pay divided by 2080 hours) by 200 (five weeks of training times forty hours per week).

For the GS-5, the pay cost during training was \$1460 (\$7.30 x 200). The pay during training for a GS-7 was \$1826 (\$9.13 x 200). These civilian pay costs were substituted for the student pay and allowances element (\$327.87) and the remaining elements were adjusted to FY 83 costs as before. Thus, the training cost for a GS-5 is \$2562, and, for a GS-7, the cost is \$2928. This equates to an annual cost of \$148,596 to train fifty-eight GS-5's, or \$169,824 to train the same number of GS-7's. Once again, it should be emphasized that the cost of civilian training is overstated using this methodology, however, this "worst case" costing is utilized due to lack of information on civilian handler turnover rates.

Table V lists the start-up costs for a mix of all GS-5

TABLE V
Start-up Costs of GS-5 Handler Positions

CBCM Cost for 158 GS-5 Positions	\$3,640,162
Training Costs for 58 GS-5 Positions	148,596
Total Start-up Costs for GS-5 Positions	\$3,788,758

DDD handler positions, including training costs.

Table VI lists the start-up costs for a mix of all GS-7 DDD handler positions, including training costs.

Tables VII and VIII list the recurring costs of maintaining a force of all GS-5 or GS-7 handlers, respectively.

TABLE VI
Start-up Costs of GS-7 Handler Positions

CECM Cost for 158 GS-7 Positions	\$4,627,188
Training Costs for 58 GS-7 Positions	169,824
Total Start-up Costs for GS-7 Positions	\$4,797,012

TABLE VII
Annual Costs of GS-5 Handler Positions

CECM Cost for 158 GS-5 Positions	\$3,575,224
Training Costs for 58 GS-5 Positions	148,596
Total Start-up Costs for GS-5 Positions	\$3,723,820

TABLE VIII
Annual Costs of GS-7 Handler Positions

CECM Cost for 158 GS-7 Positions	\$4,547,082
Training Costs for 58 GS-7 Positions	169,824
Total Start-up Costs for GS-7 Positions	\$4,716,906

V. PRIVATE CONTRACTOR DDD HANDLERS

Private contractors are a potential source of supplying DDD handler services to the Navy. This chapter begins with a description of the policies for acquiring commercial services needed by the Government. OMB A-76 procedures for calculating contractor costs and comparing these costs to that of in-house civilians then are summarized. Next, a general discussion of dog handler services available in the private sector is presented. The availability of potential private sources for DDD handlers is confirmed by the identification of thirty-one firms that train DDD's and handlers. Contractor cost estimates from three potential sources are presented. The chapter ends with a discussion of potential problems that may preclude DDD contracting in some cases.

A. GOVERNMENT POLICIES FOR ACQUIRING COMMERCIAL SERVICES

OMB Circular A-76 establishes the policies and procedures used to determine whether needed commercial or industrial type work should be done by contract with private sources or in-house using Government facilities and personnel (OMB, 1979 (1)). Recognizing the importance of the private enterprise system, the Government has established the policy of relying on competitive private enterprise to supply the products and services it needs. The Government's policy, as expressed in OMB A-76, builds on three precepts:

1. Rely on the Private Sector. The Government's business is not to be in business. Where private sources are available they should be looked to first to provide the commercial or industrial goods and services needed by the government on the public's behalf.

2. Retain Certain Governmental Functions In-House. Certain functions are inherently governmental in nature, being so intimately related to the public interest as to mandate performance by Federal employees.
3. Aim for Economy; Cost Comparisons. When Private performance is feasible and no overriding factors require in-house performance, the American people deserve and expect the most economical performance and, therefore, rigorous comparison of contract costs versus in-house costs should be used, when appropriate, to decide how the work will be done.

The first of these precepts is addressed in this chapter with a discussion of the availability of private sources for DDD handlers. Precept two was addressed in Chapter V which presented the rationale for determining that the DDD handler billets are not governmental functions and therefore should not be retained in-house. Precept three is discussed in Chapter VIII when cost comparisons of military, in-house, and contractor DDD handler services are made.

B. OMB A-76 PROCEDURES FOR CALCULATING CONTRACTOR COSTS

The "Cost Comparison Handbook," a supplement to OMB Circular A-76, provides detailed instructions for computing contractor costs for acquiring needed products or services from the private sector. The major considerations in calculating contractor costs are:

1. The contract cost figure must be based on a binding firm bid or proposal, solicited in accordance with pertinent regulations.

2. To ensure compatibility and equity in the cost analysis, a comprehensive Statement of Work (SoW) must serve as the basis for determining both the contractor and the government cost.
3. The factor to be used for the government cost of administering contracts ... is four percent of the contract price or the expected cost.
4. An existing in-house activity will not be converted to contract performance on the basis of economy unless it will result in savings of at least ten percent of the estimated government personnel costs for the period of the comparative analysis.

Conducting a comparative cost analysis study requires the participation of several functional and staff offices. Representatives from the personnel, budget, finance and accounting, legal and contracting offices are usually involved in the process.

The preparation of the SoW is one of the major steps in the cost comparison process. The SoW describes what is to be done but does not prescribe how it is to be done. It provides performance standards to ensure a comparable level of performance between the government or contract alternatives and to serve as a basis for evaluating the alternatives. The SoW describes the duties, tasks, and responsibilities inherent in providing the required goods or services and also details requirements for furnishing such resources as facilities and materials.

After the SoW has been prepared and reviewed by the contracting officer, the requirement is advertised, usually through the Commerce Business Daily. In the case of unique products or services, the agency identifies known commercial sources through other available means. Firm bids or

proposals are then solicited to determine the lowest acceptable contract price. The contracting officer will determine the lowest responsive and responsible bidder and submit the dollar amount of the bid to the individual responsible for the cost analysis. The contractor's cost is compared to the in-house estimate in accordance with the procedures outlined in the handbook. After an independent agency audit and approving authority review, the contracting officer of the originating command announces the results of the cost study. The decision between in-house or contractor alternatives will be based on the least cost proposal (CMB, 1979 (2)).

C. DDD HANDLERS IN THE PRIVATE SECTOR

There are numerous dog training schools in the private sector that train dogs and handlers for a variety of duties including: general police and law enforcement duties; patrol and security work; tracking; crowd control; building search; explosives detection; and narcotic detection. In the area of narcotic detection, a number of firms provide DDD's and handler training for police departments who use the dogs in local law enforcement operations. DDD's may also be supplied to police or security personnel at airports. DDD teams may be hired periodically by private industries to search facilities and personnel. LGS Certified Inc., a company headquartered in Kenner, Louisiana, claims that eighty percent of its clientele are companies in the petroleum industry (LGS, 1982). According to LGS, drug use in the petroleum industry, particularly on off-shore drilling rigs, is high, due, in part, to the isolated and hazardous work environment to which personnel are subjected. The chemical industry is another example of industries that employ the services of DDD teams for routine searches.

Civilian companies may apply for DEA registration to obtain and use controlled substances for the purpose of training narcotic detector dogs. DEA supplied the following information on the requirements for DEA registration for civilian DDD trainers:

To establish such a program in the United States, civilian or government agencies must obtain a DEA researcher registration. If Schedule I or Schedule II (controlled) substances are to be used as training aids, the applicant must submit a protocol along with his application which outlines the proposed activities and scope of the program. Prior to granting a registration, a background investigation is conducted by our investigators to insure the program has adequate security for the controlled substances and (the agency) is aware of DEA recordkeeping requirements. Qualifications of key personnel are also reviewed to insure the applicant is qualified to operate a drug detector dog program (DEA, 1983).

Appendix R contains a list of thirty-one civilian firms which have been granted certification to maintain controlled substances for the purpose of training DDD's. DEA advised that the list is not all-inclusive, but does include the majority of companies currently registered with DEA to train DDD's.

D. CONTRACTOR COST ESTIMATES

The development of a SOW is beyond the scope of this thesis. Therefore, it is not possible to conduct a comparative cost analysis, within OMB A-76 guidelines, in this thesis. However, the author contacted several firms to solicit their estimates of the cost of providing DDD handler teams to the Navy. The results of one unsolicited and two solicited proposals serve as the basis for estimating contractor costs.

DDD program annual costs using military or civilian handlers were determined by multiplying the EBCM and CBCM costs for a given military billet or civilian position by

the 158 authorized DDD handler billets. This approach to determine total program costs was based on two assumptions: first, that the Navy could provide the requisite number of military or civilian handlers in the required location. Secondly, the costs of military or civilian handlers are independent of the handler's geographical location. It does not appear reasonable, however, to determine annual contractor costs in the same manner. In the first place, it is unlikely that any single private source could provide all 158 handlers. Most private sources that train DDD teams are small companies. The companies which the author contacted did express an interest in providing services outside their geographical area. However, it is not reasonable to expect that any single firm could provide full-time handler services, at a reasonable cost, in all authorized Navy locations throughout the country. Secondly, the proposed cost of private contractor services is dependent on local wage rates in the geographical area and number of firms competing for the bid in that area. Therefore, no attempt is made in this chapter to determine the total annual cost of contracting for all DDD handler billets. Instead, examples of estimated contractor costs per handler are provided. Cost comparisons of military, civilian, and contractor costs are discussed further in Chapter VII. In the remainder of this section, three contractor cost estimates for DDD handler services are presented.

1. LGS Certified Inc.

LGS Certified Inc., located in Kenner, Louisiana, submitted to the Navy an unsolicited proposal to furnish contraband detector dogs, handlers, and investigators (LGS, 1982). LGS claims that they are the largest private narcotic detector and search firm in the United States. LGS' clientele consists primarily of companies in the

petroleum industry but the company has also worked with a number of other firms in the marine, trucking and nuclear power industries and with the National Aeronautics and Space Administration.

In describing its proposed operational concept, LGS stated that the company operates on a "mobile principle whereby it dispatches the desired number of teams to a given area, conducts the search as requested and returns back to its base of operations." LGS stated its intention to train, house, and base most of the personnel assigned to this project in New Orleans, Louisiana.

LGS' initial proposal offered a one year fixed price contract for forty teams at a cost of \$3,900,000. LGS defined the basic components of a team as a narcotics canine, handler, and investigator. The cost per team was \$97,500.

After subsequent discussions with Navy representatives, LGS submitted a supplemental proposal to replace the earlier offer (Sullivan, 1982). LGS proposed providing the Navy with four search dog handler teams. A team, in this case, consists of a handler and DDD. LGS would assume the following costs: acquisition and training of the dogs and handlers; care and feeding of dogs; deployment of DDD teams to the first Navy base duty station; and subsistence of handlers while on base duty station. In addition to the basic contract cost for services, LGS proposed that the Navy would pay the cost of travel and subsistence for a reserve team when the Navy elected to use this team. Although not specifically stated, the LGS proposal implies that the Navy will also pay the cost of deployment to subsequent Navy base duty stations.

The proposed cost indicated in the supplemental proposal, for a four unit search dog handler component, with one search dog handler reserve team, was \$350,800 for the

first year, \$266,850 for the second year, and \$290,400 for the third year. The first year costs include start-up costs. The cost for the second and third year would be subject to an inflation factor. For the purpose of this thesis, contractor start-up costs were derived by dividing the first year program cost by five. Start-up costs per man year were determined to be \$70,160 per handler. Costs for the second and third year were averaged to derive a recurring annual contract cost per handler of \$69,656.

The first year program cost was divided by five to derive the start-up cost per man year of \$70,160 per handler. Costs for the second and third year were averaged to derive a recurring annual contract cost per handler of \$69,656.

2. Mandelyn Kennels

Located in Bakersfield, California, Mandelyn Kennels has trained dogs for a variety of jobs including patrol and security work, police work, and drug and explosive detection. The author contacted Mr. Ray Marcois, owner, to request an estimate of the cost of providing the Navy with a DDD team. After several telephone conversations with the author, Mr. Marcois submitted his cost estimate (Mandelyn, 1983). The proposal was for a "one man-dog team, trained in narcotics search, available for assignment to an area designated by the Navy". Fees for this service were based on a monthly rate for a forty hour work week with the handler's shift subject to change according to need. Table IX gives the breakdown of Mandelyn's proposed costs.

TABLE IX
DDD Team Cost Proposed by Mandelyn Kennels

Item	Cost
Monthly salary for handler	\$1800
Monthly dog rental fee	700
Contractor's profit per month	625
Total monthly DDD team cost	\$3125
Total annual DDD cost	\$37,500

3. Rudy Drexler's School for Dogs

Rudy Drexler's School for Dogs, located in Elkhart, Indiana, conducts a variety of courses including: basic dog obedience training for dogs and their owner's; training dog teams for retail and industrial security; police dog training; and narcotics and explosive detector training. The Drexler company has trained narcotics dogs for police and security agencies in the United States and in foreign countries. Proposed costs for a DDD team contracted from Drexler's company are listed in Table X (Drexler, 1983).

According to the information obtained from a later interview with Mr. Drexler, the dog purchase cost would be a start-up cost and would be incurred again only after the dog had outlived its useful life. Mr. Drexler indicated that more definitive cost estimates would depend on the exact location of the handler team.

TABLE X
DDD Team Cost Proposed by Rudy Drexler

Item	Cost
Handler fee (includes salary, payroll taxes, insurance)	\$20,000
Dog purchase	3,500
Contractor's profit (10% of handler salary of \$18,000)	1800
Annual start-up cost	\$25,300
Annual recurring cost (less dog purchase)	\$21,800

E. POTENTIAL PROBLEMS WHICH MAY PRECLUDE CONTRACTING

There are several legal and political considerations that may impact the decision to employ contractor DDD teams even if this method is found to be the most cost effective way to provide these services to the Navy. In this section the author presents three specific issues for consideration.

1. The Mobile Team Concept

According to IGS, the mobile basing concept could provide DDD handler services to the Navy at a lower cost. If fewer contractor handlers could replace a given number of military billets, this may indeed be more cost effective, even given a somewhat higher cost per handler. However, even with a responsive mobile team, it may not be possible to satisfy a commanding officer's request for an expeditious drug search. Quick response capability for DDD teams is desirable in discouraging abuse and identifying drug abusers. Furthermore, it could be argued that the regular presence of a dog team on a base, is in itself, of some

value in deterring drug abuse. Considering the transportation costs that must be borne by the Navy, it is not reasonable to expect the mobile team to provide the same level of service at a cheaper cost as could be done by a stationary team.

The mobile team concept may also be infeasible due to legal considerations. It would be necessary to establish the credibility of each DDD team to every commanding officer in every area that might utilize the team. As discussed in Chapter II, this credibility certification is necessary to prove that probable cause exists for conducting a search. With several DDD teams and numerous commanding officers involved, it may be difficult to ensure that every commanding officer on every base has sufficient knowledge and confidence in the drug detection capability of each DDD team. The credibility issue could easily result in a number of cases being dismissed by the courts due to lack of probable cause.

2. The AF Position on Dog Certification

As previously discussed, the Air Force (AF), as single unit manager of the MWD program, is responsible for all aspects of procurement, training and employment of MWD's. The AF has developed certification standards for DDD's used in DoD. AF personnel are responsible for the initial certification of DDD's completing the Drug Contraband Detector Course. The AF certification of DDD's has a potential impact upon contracting efforts for DDD services.

The AF's position on certification of contractor dogs was demonstrated in July 1982, when DoDDC responded to a request from Headquarters, USMC, for commercial procurement of patrol/narcotic dogs. At this time, the Marine Corps was expanding its MWD program but was unable to

procure dogs from the AF due to a backlog of requests at DoDDC. The AF position was that dogs bought through a contract must be evaluated at Lackland against standards already in use. The AF stated that dogs would not meet the certification standards unless evaluated by AF personnel at Lackland. The AF further indicated that it did not have the manpower or funding to allow for travel of AF personnel to contractor sites for the purpose of certifying dogs (3280th TCHTG, undated).

In this case, the problem was resolved when the AF, having been supplemented with additional trained handlers from the other services, was able to provide the requested number of dogs to satisfy the Marine Corps' requirements. However, unless the certification issue is resolved, the requirement to have contractor dog teams certified, and possibly recertified, at Lackland, would add to the contractor's cost estimates and possibly make contracting of DDD teams cost prohibitive.

3. Congressional Legislation Concerning CA Studies

In September 1982, The Chief of Naval Operations issued a message to Navy activities advising them of a one year moratorium, imposed by Congress, on conducting cost studies of firefighters or guard/police/security functions (CNO, 1982(2)). According to this message, the Defense Authorization Act prohibited:

the obligation or expending of any FY 83 funds for contracting for performance of firefighter functions or security functions at any military installation, except when such funds are for renewing contracts which are already in effect.

One view of this issue, which sheds light on the possible cause of the moratorium, was presented by Mr. Fred Schillreff who appeared before a House subcommittee as a representative of the International Association of Firefighters (IAFF). In Mr. Schillreff's view, fire fighting and base security functions are inherently governmental in nature. He opposed the contracting out of these functions stating that such contracting "poses a major threat to the security of our nation and its citizens" (HASC, 1982). In other written testimony, the Hon. Sam Gejdenson, representative from the state of Connecticut, discussed a bill that he introduced (H.R. 5728) which would prohibit contracting out of firefighter and security services at military bases. Mr. Gejdenson supported the view that these services should not be contracted out to the lowest bidder. The congressman stated that he was led to introduce his bill because of:

the combination of the potential disruption of our military readiness and security coupled with the threat to civilian and military lives and property posed by the inadequate or inefficient and unreliable protection that may result from contracting out (HASC, 1982).

Based upon the testimonies of Mr. Schillreff and Mr. Gejdenson, quality, reliability, and responsiveness of contractor performance appear to be the major concerns in the contracting out of firefighters and security guards.

Captain Cook, the Navy CA program manager, stated that the congressionally imposed moratorium had been lifted effective 31 March 1983. However, he indicated that it is likely that legislation will be introduced in FY 84 to permanently exempt firefighter and security guard positions from the CA cost comparison process. Since government employed DDD handlers are generally hired in the Security or Guard series, it is likely that this legislation could also

be interpreted to prohibit contracting out of DDD handlers. Final resolution of this issue remains to be seen. However, congressional decision makers should consider the economic impact of exempting DDD handler positions from the CA cost comparison process.

VI. DDD PROGRAM NON-PERSONNEL COSTS

Although manpower costs constitute the major portion of the costs of operating the Navy's DDD program, there are several other cost elements that must be identified in order to properly compare the cost of the various manpower alternatives. For instance, costs involved in acquiring and training DDD's and providing the dogs with food and veterinary care must be considered. Likewise, the costs of operating and maintaining kennel facilities and associated support spaces must be included in the cost model.

Once again, the emphasis is on annual marginal costs involved in operating the program at authorized levels. The cost data included in the analysis reflect, as closely as possible, the total taxpayer cost of the program rather than just the costs incurred directly by the Navy. Thus, costs for procurement and training of dogs that are incurred by the Air Force are allocated to the Navy according to a fair-share percentage. The Navy's share for these costs is based on the number of Navy dog purchases as a percentage of total Air Force dog purchases.

Costs which are considered "sunk," i. e. already have been expended, are not included in the cost analysis. The cost of existing buildings or equipment used in the DDD program are examples of "sunk" costs. However, estimates of costs for kennel facilities and equipment will be provided since these costs should be considered in those cases where new facilities must be acquired.

All costs are adjusted to reflect FY 83 projected costs. Military and civilian personnel salaries and benefits are adjusted by the known pay raise percentages for each of these manpower categories. As discussed in Chapter III, a

PCES Index of 1.15 is used to adjust FY 81 costs and a PCES index of 1.09 to adjust 1982 costs.

A. DDD PROCUREMENT AND TRAINING COSTS

The Department of Defense Dog Center (DoDDC), Lackland AFB, Texas, is responsible for the procurement and initial training of military working dogs. Dogs are acquired from one of three sources. "Local " source refers to dogs acquired from individuals living in the San Antonio area. "Correspondence" refers to those dogs acquired from owners living outside the San Antonio area who become acquainted with the MWD program and contact the DoDDC to donate or sell their dog. "Recruiting Trip" dogs are acquired by DoDDC personnel who travel to select areas throughout the country to evaluate and purchase dogs.

The procurement costs of acceptable local source dogs include of an average FY 81 purchase price of \$205.60. In addition to the purchase price, procurement costs for correspondence dogs also includes transportation costs to ship the dog to DoDDC for evaluation and to return unacceptable dogs to their owners, at the owner's request. In determining the cost of recruiting trip dogs, transportation and per diem costs for DoDDC personnel also must be considered as well as advertising and dog transportation costs.

It is assumed that the DoDDC is exploiting the current local and correspondence sources to the maximum, hence additional dogs must be obtained through recruiting trips. The marginal procurement cost per dog therefore, should consist of the adjusted average price paid per dog plus the adjusted average of transportation and other costs associated with purchasing a dog from the recruiting trip source.

In addition to the procurement costs, DoDDC incurs costs associated with kenneling and feeding of dogs. These costs fall into two general categories, personnel costs and operations and maintenance costs. Costs for veterinary care are incurred at the USA Medical Center, Wilford Hall, which provides veterinary care for DoDDC. Finally, DoDDC operates a "green dog" training program for conducting initial dog training. Military personnel costs are the primary costs attributed to this function.

In FY 81, DoDDC conducted a one time cost study to identify the taxpayer costs for operation and support of this facility (Barr, undated). are presented in Appendix S, Sections I through IV. Unadjusted costs are in FY 81 dollars unless otherwise noted.

An estimate of the Navy's share of DoDDC costs is presented in Section V of Appendix S. Costs are divided into variable and fixed/semi-variable categories. For purpose of this thesis, these variable costs are interpreted as the marginal cost of adding one additional dog to the Navy's DDD inventory. Fixed and semi-variable costs are those costs which would not change if the Navy required only one additional dog. However, since it is desirable to determine a total taxpayer cost of the Navy's DDD program, these costs will be allocated to the Navy by fair-share percentages.

In order to estimate the Navy's fair-share of DoDDC's costs, the annual Navy requirement for DDD's must be estimated. Data obtained from NIS indicates the following actual or projected numbers of Navy DDD purchases for the following calendar years: CY 80 - 4 dogs; CY 81 - 32 dogs; CY 82 - 117 dogs; and CY 83 - 33 dogs. As can be seen, actual requirements vary considerably from what one might expect for the ideal "steady-state" system. For instance, in CY 80, the Navy's DDD program was relatively small, hence

only four dogs were purchased that year. In CY 82, however, several handler billets were added to the DDD program resulting in an unusually large number of dog purchases that year.

For the purpose of this thesis it was necessary to develop a model of annual dog purchases required to support 158 authorized DDD billets. Given that a healthy dog can be expected to serve a useful life of eight years as a DDD, it would be expected that at least twenty dogs ($158 / 8 = 19.5$) must be purchased each year as replacements for retired dogs. It could be expected, however, that during the course of a year some dogs may be injured or contract some disease or illness rendering them unsuitable for further useful service. It is also possible that a fraction of the dogs may not perform properly in the operational setting and may have to be returned to DoDDC for retraining or other disposition. Although no data was available on the number of dogs who must be replaced for these reasons, Dr. Townsend, an Air Force veterinarian at Wilford Hall Medical Center, estimated that perhaps five out of every 100 dogs would fall in this category (Townsend, 1983). Therefore, eight of the 158 DDD's must be replaced annually due to such extraordinary circumstances. Thus estimates of Navy DDD costs are based on an annual requirement to purchase a total of twenty-eight dogs, twenty as replacements for retiring dogs and eight as replacements for dogs lost due to extraordinary circumstances.

Total Navy fair-share costs for the author's model level of dog purchases, as well as that of other purchase levels, are presented in Section V (c) of Appendix S. Variable costs are the product of the number of dogs purchased times the total variable cost per dog. Navy share of F/SV costs are calculated by dividing the number of Navy dogs purchased by 386 (the total number of MWD's purchased by the AF in

FY 81) and multiplying that fraction by the total F/SV costs. The Navy fair-share of DoDDC costs for the procurement and training of DDD dogs is therefore estimated to be \$172,458 per year (an average of \$6159 per dog).

B. DOG PURCHASE COSTS

DDD's are purchased from the Air Force through normal supply procedures. Requisitions are submitted in MILSTRIP format using Federal Stock Number 8820-238-8577 DX for the Detector Dog (Narcotic/Contraband). Funding and requisitioning of dogs is handled by the NIS. The cost of a DDD is \$478 which includes the basic acquisition cost and first destination transportation cost, as well as the cost of some basic equipment issued with the dog, eg. leash and collar.

The purchase cost of a DDD represents a direct cost to the Navy. Although this money is transferred to another DOD department, it is included in the cost analysis. Including the purchase cost may be considered "double counting" because, in a sense, the AF is being reimbursed for the cost of the dog. However, the \$478 is only a fraction of the real cost for the AF to procure a dog. The cost of transportation of the dog to the Navy activity alone would account for at least one-third of this price. The cost of equipment provided with the dog and general costs for handling, preparation and shipping also must be included. Therefore, it is assumed that the Navy cost to purchase a dog is a marginal economic cost which should be included in the cost analysis. Based on the author's model of annual purchase levels discussed in the previous section, the yearly cost to the Navy for dog purchases is estimated to be \$13,384 ($\$478 \times 28$).

C. DOG FOOD COSTS

The recommended diet for MWD's consists of a dog food known as Maximum Stress Diet (MSD). This dog food is available through military supply channels in twenty-five pound cans at a cost of \$29 per can. The amount of dog food consumed daily depends on the size and activity level of the individual dog. In discussions with several military dog handlers it was indicated that the average dog consumes between one and one and one-quarter pounds of dog food daily (Zullo, 1983). Using a 1.25 pound daily consumption rate, it is estimated that the average dog consumes 456 pounds of dog food annually which is valued at \$529. Dog food for the 158 authorized DDD's would be expected to cost \$83,582 annually.

D. VETERINARY SERVICES COSTS

Veterinary services for Navy DDD's are frequently provided by Army and Air Force veterinarians serving at nearby military installations. Provisions for these services are usually stipulated in an inter-service support agreement, although the Navy is not normally required to reimburse the Army or Air Force for the cost of veterinary care. Civilian veterinary services may be used when a military veterinarian is not available locally or in certain emergency situations.

According to Dr. Townsend of the Air Force Veterinary Clinic, Wilford Hall Medical Center, MWD's are required to receive semi-annual physical examinations. In some cases, physicals may be conducted more frequently. DDD's at NAS Alameda, for instance, receive physicals on a quarterly basis (Fant, 1983). During the physical, routine lab tests are conducted and immunization shots are given. In addition to routine physicals, dogs occasionally may require

emergency care for injuries or illnesses. Since specific military veterinary cost data is not available, estimates of the cost of civilian veterinary care are used to reflect the resource costs involved in providing veterinary care for DDD's. Dr. Townsend estimated that the cost of a semi-annual dog physical, including the cost of veterinary services, lab tests and shots, would be a minimum of \$50. The estimated cost for an emergency visit would be a minimum of \$20. For costing purposes, it is assumed that each Navy DDD receives two physicals and visits a veterinarian at least one other time for emergency treatment during the course of a year. Total veterinary service cost for each dog is therefore estimated at \$120. For the 158 authorized DDD's, total annual veterinary costs are \$18,960.

E. DOG KENNEL UTILITIES AND MAINTENANCE COSTS

The annual cost for utilities and maintenance of office spaces, kennel runs and associated facilities used by dog handler teams also must be considered. Aggregate data on utilities and maintenance costs are maintained by Public Works Centers (PWC's) for activities served by those centers. The Utilities Cost Analysis Report (UCAR), prepared on a monthly basis, includes the cost of such produced or purchased services as natural gas, electricity, sewage, potable water, and maintenance. It is recognized that utilities and maintenance costs will vary depending on geographical location, however, for the purpose of this study it was necessary to develop an estimate of Navy-wide utilities and maintenance rates.

Average Navy-wide costs per square foot for utilities and maintenance of kennel facilities were estimated using FY 82 UCAR shore activities cost data supplied by PWC, Norfolk, Virginia. Norfolk was selected as a standard for estimating

these rates because of the moderate climate in the area. For FY 82, annual UCAR costs for utilities and maintenance in the Norfolk area averaged \$1.01 per square foot. By comparison, FY 82 UCAR cost data obtained from PWC Monterey, California indicated an average cost of \$1.15 per square foot. Adjusting the Norfolk area FY 82 cost figures, using the PCES index of 1.09, yields an adjusted FY 83 cost of \$1.10 per square foot for utilities and maintenance.

The number of square feet of space devoted to the DDD function varies from location to location. Variations in design and in the amount of support space provided affects the size of the facility, as does the number of dog handler teams authorized at the location. In many cases, adequate support facilities for DDD handlers are not available. At some facilities for instance, office spaces are shared with security department personnel. All these factors contribute to the difficulty in. However, in order to estimate the utilities and maintenance costs associated with the DDD program it is necessary to assess the number of square feet allocated Navy-wide for kennel facilities. The remainder of this section, therefore, is devoted to discussing two examples of kennel design and to developing a model of the estimated size of Navy DDD kennels.

The newly constructed kennel facility at Naval Submarine Base Bangor, Washington is one example of Navy kennel facility design. This facility, completed in November 1982, was constructed by Navy Seabees at a cost of \$48,600. The main support building occupies approximately 480 square feet and consists of an office space, bunk room, food preparation area, and medical treatment area. Nine wire-cage kennel runs, each with a dog house, are attached to the support building under an adjoining roof. The kennel runs occupy an additional 572 square feet, making a total of 1052 square feet of combined kennel and support spaces. The entire

kennel facility is surrounded by a fence. There is also an outdoor obstacle course, 150 feet by 75 feet, which is enclosed by a chain link fence and lighted by six street lights (Sturdevant, 1983).

Another example of kennel facility design is found at the Strategic Air Command (SAC) Headquarters, Offut AFB, Omaha, Nebraska. This kennel is the prototype design for SAC activities. A pre-engineered metal building, approximately 30 x 60 feet, (1800 square feet), is adapted for kennel use. The kennel houses twelve dogs and has a kennel-master's office, other office space, food storage area, treatment area, and an isolation kennel. Cost for the building and equipment is approximately \$120,000. The kennel area occupies approximately 30 x 40 feet (1200 square feet) including kennel runs and aisle space in the kennel area. The support areas are 30 x 20 feet or a total of 600 square feet (Dines, 1983).

These two kennel designs, although useful for illustrative purposes, are not typical of most Navy kennels. Of the seventy-five Navy activities authorized DDD's, forty-five are authorized only one DDD, and seventeen of these one dog activities are Navy ships (Appendix A). Table XI summarizes the distribution of DDD's among Navy activities.

In order to estimate the utilities and maintenance costs for Navy kennel facilities, it was necessary to make several assumptions concerning the number of square feet of kennel space required at each activity. Kennel facility space requirements are examined based on five attributes: office space; kennel space; food preparation area; treatment area; and storage space. Only kennel activities ashore are examined in this cost element due to the difficulty in estimating both space requirements and utilities costs for

TABLE XI
Distribution of DDD's Among Navy Activities

Number of DDD Teams	Number of Activities
One {Shore - 28} {Ships - 17}	45
Two	13
Three	5
Four	3
Five	4
Six	2
Eight	1
Ten	2

Source: Adapted from Appendix A

ships. The author's estimates of kennel space requirements are based on data gathered in an interview with a kennel designer (Dines, 1983) and visits to kennel facilities at NAS Alameda, Fort Ord, Seaside, California, and the Washington D. C. Police Department Canine Center.

In estimating office space requirements for DDD handlers, the Facility Planning Criteria for Navy and Marine Corps Shore Installations was consulted. This publication suggests that office space requirements for a supervisor, grade E-7 are ninety square feet. The size of a kennelmaster's office, therefore, is assumed to be 90 square feet since the kennelmaster is a paygrade E-7 or E-6 supervisor. Although this manual does not specifically state space requirements for E-6 and below, it does recommend that

clerical personnel be allocated sixty square feet of space per person. per person (approximately 7.75 x 7.75 feet). Total office space required for the kennel support area is, therefore, assumed to consist of ninety square feet of space for a kennelmaster's office plus an additional sixty square feet of space per handler assigned to that facility (DoN, 1982(2)).

According to Mr. Dines, the average kennel run measures 5 x 8 feet (40 square feet). In addition to this, at least 3 x 5 feet (15 square feet) of aisle space should be allocated for each kennel run. Therefore, kennel space requirements are estimated to be fifty-five square feet per dog.

The food preparation area is usually located adjacent to the kennel runs. In this area, dog food and medicinal supplements are prepared. Feed pans and assorted utensils normally are stored here, as well as some of the dog food stores. It is assumed that this area measures 7 x 7 feet and its size does not vary whether there are one or ten dogs assigned to the facility. Therefore, food preparation area requirements are assumed to be forty-nine square feet per kennel.

Although not all kennels have a treatment area, it is desirable to include space for treatment, examination and grooming of dogs in the design of a kennel. The treatment area may be a room in itself, or may be part of the general administrative space. Based on the author's observation of three kennel facilities, the treatment area space developed for the author's Navy kennel model is approximately the size of a small office space and measures 8 x 8 feet (64 square feet).

Storage space required to hold equipment and supplies is estimated to be about ninety square feet, or approximately the size of the kennelmaster's office. Using these

estimated space requirements, Appendix T illustrates the author's model of the expected sizes of Navy kennel facilities. By multiplying the number of shore activities in each DDD team size category by the estimated size of the kennel facility for that category, the total number of square feet of kennel space for Navy shore activities is estimated to be 29,729. At an annual adjusted FY 83 utilities and maintenance cost of \$1.10 per square foot, the total utilities and maintenance cost for kennel facilities is estimated to be \$32,702.

F. MISCELLANEOUS COSTS

There are several other costs associated with the DDD program that are minor costs or costs that are difficult to quantify. The annual cost of equipment replacement for such items as collars, leashes, and dog food pans, for instance, is considered trivial. The cost of administrative supplies and forms is also considered insignificant. The marginal cost of local transportation for the dog via Navy vehicle is difficult to quantify. These costs, therefore, are not included in the non-personnel cost analysis.

G. KENNEL "NEW START" COSTS

As previously mentioned, the cost of kennel facilities are not included in the cost analysis since they are considered "sunk" costs. However, decision makers should consider new start kennel costs in their cost analysis.

Expanding the DDD program to new locations may require considerable investment costs depending on the size, design, and location of the facility. Cost data for kennel construction was obtained from NIS (Zullo, 1983). Although the AF has published specifications for the design of kennels, the Navy does not currently use these design plans

in constructing its kennels. To save costs, the Navy prefers to modify existing facilities rather than design new kennel facilities. At NAS North Island, California, for instance, an existing detention facility was modified for use as a two dog kennel at a cost of \$525. A four dog facility at NAS Alameda was built at a cost of \$26,000. This cost includes outdoor kennel runs but no office or support spaces. The newly constructed facility at Bangor, Washington, which was previously mentioned, was built by Navy Seabees at a cost of \$48,600. (MACS Sturdevant, Security Chief at Bangor, indicated that Navy Seabees had estimated that this same facility would cost \$150,000 had it been built by a private contractor).

As can be seen, kennel construction costs can vary considerably depending on whether existing facilities are modified or new facilities are constructed. Costs will appear to be lower if the facility is built under a self-help program largely because the cost of military labor is not included in the cost computations. Where new kennel construction is required, these investment costs must be considered in the cost analysis.

H. TOTAL DDD PROGRAM NON-PERSONNEL COSTS

The total cost of the five non-personnel cost elements discussed in Sections A through E of this chapter are summarized in Table XII. These costs, although relatively small when compared to the costs of manpower for this program, should be considered part of the annual recurring cost to operate the Navy's DDD program. The total DDD program non-personnel costs of \$321,093 represent an average cost of \$2033 for each of the 158 authorized DDD handler billets. The average non-personnel costs are used in Chapter VII in developing government and contractor cost comparisons.

TABLE XII
DDD Program Non-Personnel Costs

Item	Cost
DDC Procurement and Training Costs	\$172,458
Dog Purchase Costs	13,384
Dog Food Costs	83,582
Veterinary Services Costs	18,960
Kennel Utilities and Maintenance Costs	32,709
Total Non-Personnel Costs	\$321,093

VII. COST COMPARISONS

This chapter summarizes military billet costs and civilian position costs for the authorized DDD handler positions. The annual cost savings resulting from conversion of military billets to civilian positions is identified. Next, premium pays are considered in the cost analysis and military costs are compared to civilian position costs at various overtime levels. The effect of changes in the military billet paygrade level on military billet costs is discussed. Military handler costs for lower grade personnel are compared to civil service handler costs. Proposed contractor cost estimates are summarized. Finally, contractor costs are compared to civil service costs by developing a break-even cost for conversion to contractor services.

In other studies of this type (Gilluly, 1978), a key variable, the military-civilian substitution (CIV-SUB) ratio, is developed. The CIV-SUB ratio reflects an assumption concerning the number of civilians required to replace a military member in a given billet. This ratio, expected to be less than one, indicates that, in general, a given job can be performed with fewer civilians than military members (Gilluly, 1978). For instance, in civilianizing Training Deviceman (TD) billets, it was found that, in one case, thirty-six TD's were replaced by twenty civilian technicians, a CIV-SUB ratio of .56 (CNO, 1982(1)).

The basic argument proposed for the CIV-SUB ratio is not that military personnel are less competent than civilians, but that the institutional characteristics of military service impose added duties on military members. Military rotation policies, for instance, result in a less stable

manpower force than could be achieved with civilians. Watches, collateral duties, and other military functions imposed on military members reduce the member's productivity in his primary duty.

For the purpose of this study, however, the author contends that use of the CIV-SUB ratio is not appropriate. While it is true that military members may be required to perform other duties aside from the DDD handler function, there are not necessarily any efficiencies in manpower to be gained from civilianizing a position. The dog is an essential element in the DDD team and is the limiting factor in the team's operation. Even a well-trained and cooperative dog will not work a full eight hour day searching for drugs. Despite this fact, the handler job can be a full-time one since the handler is required to attend to related administrative duties, kennel upkeep tasks, dog grooming, and other tasks integral to the job but not directly related to drug detection. Depending on the individual DDD handler and the command's ability to fully utilize the DDD team, the total demands upon the DDD handler's time available for non-DDD handler duties can vary. Therefore, cost comparisons in this chapter are based on a one-to-one substitution of civilians for military manpower.

A. COMPARISON OF MILITARY AND CIVILIAN COSTS

The annual billet and training costs for military and for civil service handlers are presented in Chapters III and IV respectively. Table XIII summarizes the total cost of the current mix of military handlers and the start-up costs for converting to GS-5 and GS-7 handler positions. As discussed in Chapter IV, an additional cost element, the Initial Billet Cost, is added in the CBCM to reflect the extra start-up costs involved in establishing a new civil service position.

TABLE XIII
Military Costs and Civil Service Start-up Costs

Manpower Type	Billet Cost	Training Costs	Total Cost
Military Handlers	\$5,253,872	\$162,786	\$5,416,658
All GS-5 Handlers	3,640,162	148,596	3,788,758
All GS-7 Handlers	4,627,188	169,824	4,797,012

The first year cost savings that could result by converting from the current mix of military handlers to GS-5 or GS-7 handlers are presented in Table XIV.

TABLE XIV
First Year Cost Savings Using Civil Service Employees

Military Cost	GS-5 Cost	GS-7 Cost	Cost Savings
\$5,416,658	\$3,788,758	-	\$1,627,900
\$5,416,658	-	\$4,797,012	\$619,646

The actual cost savings would fall somewhere between the two extremes since it is expected that there would be a mix of GS-5 and GS-7 handlers in the all civil service handler force. It should also be noted that, as discussed in Chapter IV, the cost of civilian training is overstated due to lack of data on civilian turnover rates. For this reason, it is expected that further cost savings, over and above those stated in Table XIV, could be achieved.

After the initial establishment of the civil service handler positions, cost savings resulting from the conversion would improve further. Table XV compares the annual recurring costs of military and civilian handler billets.

TABLE XV
Military and Civil Service Handler Annual Costs

Manpower Type	Billet Costs	Training Costs	Total Cost
Military Handlers	\$5,253,872	\$162,786	\$5,416,658
All GS-5 Handlers	3,575,224	148,596	3,723,820
All GS-7 Handlers	4,547,082	169,824	4,716,906

The annual cost savings that could result from conversion from military to civil service handlers are presented in Table XVI.

Due to the deletion of the Initial Billet Cost Element, the annual cost savings in Table XVI are from approximately \$65,000 to \$80,000 greater per year than the start-up cost savings presented in Table XIV. The results of this

TABLE XVI
Annual Cost Savings Using Civil Service Employees

Military Cost	GS-5 Cost	GS-7 Cost	Cost Savings
\$5,416,658	\$3,723,820	-	\$1,692,838
\$5,416,658	-	\$4,716,906	\$699,752

analysis demonstrate that cost savings could be achieved by replacing the present mix of military handlers with all GS-5 or GS-7 handler billets.

B. MILITARY-CIVILIAN COST COMPARISONS INCLUDING PREMIUM PAY COSTS

The issue of premium pay for civilian handlers must be considered when comparing military and civilian handler costs. When military handlers are required to perform searches outside of normal working hours, they are not monetarily compensated for this additional work. In some cases, compensatory time off may be given. It should be recognized, however, that requiring military personnel to work overtime does imply a "cost" to the military. As an example, several types of special pays and allowances, most notably the SRB, are paid to retain personnel in ratings where long hours or harsh working conditions are experienced.

For civilian personnel, however, overtime work usually results in payment of premium pay. According to the Civilian Personnel Manual (CPM), overtime work refers to each hour of work in excess of eight hours a day or in

excess of forty hours in an administrative workweek (DoD, 1980 (1)).

The CPM describes the computation of overtime pay in Book 550, Pay and Administration, Section S1-3, as follows:

For an employee whose basic pay is at a rate which does not exceed the minimum rate of basic pay for a GS-10, the overtime hourly rate of pay is an amount equal to one-and-one-half times the hourly rate of basic pay of the employee, and all that amount is premium pay.

In deriving premium pay for a GS-5 step five, for example, the annual pay of \$15,153 would be divided by the standard 2080 hours per year to arrive at an hourly wage of \$7.29. The premium pay rate, then, would be \$10.94 per hour. Likewise, based on an annual salary of \$18,767 for a GS-7 step five, the hourly premium pay rate is \$13.54. It should be noted that if an employee is required to work overtime or return to his place of employment for overtime work, this work must be deemed at least two hours in duration for the purpose of premium pay, either in money or compensatory time off.

Other administrative devices, such as rescheduling of duty hours, can be used in those cases where unusual working hours may be required. For example, an employee could be scheduled to work a night shift between the hours of 6 P.M. and 6 A.M. In this case, the employee is entitled to a night shift differential of ten percent of his basic pay. Compensatory time off may be an alternative to premium pay in some cases. Still another alternative may be to provide premium pay on a fixed annual basis depending on the amount of overtime work expected. In this case, the premium pay would be calculated as a fixed percentage of base pay, from ten percent to twenty-five percent, depending on the number of overtime hours expected. The final decision on which method of payment is to be used in compensating civilian

employees for overtime work rests with the commanding officer, assisted by the local personnel officer (DoD, 1980 (1)).

The expected value of premium pay should be added to the cost of the civil service employees to arrive at a true comparison of civil service versus military costs for performing the DDD handler duties. In making this cost correction, however, it should be remembered that the CBCM includes an expected value of premium pay in its cost elements. For a GS-5, for instance, \$1829 is included for premium pay which equates to approximately 167 annual hours (3.2 hours each week) of overtime for a GS-5 step five. Similarly, for a GS-7, \$2305 in premium pay equates to 170 annual, or 3.27 weekly, hours of overtime on the average.

Table XVII compares billet costs, with premium pays added, for military handler's (MAC's and MA1's) with the cost of civilian GS-5 and GS-7 handlers. In this table the same annual EBCM cost is used for military personnel regardless of the number of hours of overtime worked. For civil service personnel, the annual CBCM cost is used at the three hours per week overtime level only since this level of overtime has been accounted for in the model. For every additional hour of overtime required per week, the value of the corresponding annual premium pay is calculated and added to the CBCM cost. For instance, a GS-5 required to work an average of five hours per week overtime, would earn an additional two hours of premium pay per week beyond that provided for in the CBCM. The two hours per week is then multiplied by fifty-two to arrive at 104 additional premium hours per year. At a premium wage rate of \$10.94 per hour, the GS-5 would earn an additional \$1138 in premium pay per year. This \$1138 is then added to the GS-5's CBCM cost of \$22,628 which results in an annual economic cost of \$23,776 for this handler. It can be seen from Table XVII that a

TABLE XVII

Annual Military and Civilian Cost at Various Overtime Levels

Hours Overtime Per Week	MAC Cost	MA1 Cost	GS-5	GS-7
3	\$37,724	\$33,036	\$22,628	\$28,779
5	37,724	33,036	23,766	30,187
7	37,724	33,036	24,903	31,595
9	37,724	33,036	26,041	33,003
10	37,724	33,036	26,610	33,708
12	37,724	33,036	29,454	35,116

GS-5 handler, working on an average of twelve overtime hours every week, is still less costly to employ than an MA1 or MAC. The break-even point for substituting a GS-7 for an MA1 would be at approximately nine hours of overtime per week. On the other hand, the GS-7 handler, working an average of twelve hours overtime a week, is still less costly than the MAC.

C. MILITARY COST SAVINGS USING LOWER GRADE PERSONNEL

Changes in the current paygrade mix of authorized handler billets, particularly in the MA rating, could result in cost savings. Table XVIII summarizes EBCM costs for MA's and CBCM costs for GS-4 through GS-7 civil service personnel. Although MA2 billets are not currently authorized, the EBCM cost for an MA2 is available since personnel may be converted to the rating at the E-5 paygrade. However, since there are no data available on the cost of MA3 billets, it is necessary to estimate these billet costs.

The EECM Standard Manyear Costs for MA's are approximately comparable to those of BM's across all paygrades, therefore, the cost of a BM3 is used as an estimate of the MA3 billet cost.

TABLE XVIII
Military and Civilian Billet Costs Summarized

Military Grade	EECM Cost	Civilian Grade	CBCM Cost
MAC	\$37,724	GS-7	\$28,779
MA1	33,036	GS-6	26,551
MA2	27,291	GS-5	22,628
*MA3	22,484	GS-4	19,726
*estimated from EM3 billet cost			

As Table XVIII shows, the MA3 EBCM cost would be approximately equivalent to that of a GS-5. As indicated in Table XVII, however, if the GS-5 is required to work an average of greater than three hours a week overtime, the billet could be filled more cost effectively by an MA3. An MA2, however, is more expensive than a GS-5. On the other hand, the GS-5 would have to work an average of ten hours of overtime per week in order for the MA2 billet to be more cost effective.

D. CONTRACTOR COST COMPARISONS

Examples of contractors' proposals for providing DDD handler teams to the Navy were presented in Chapter V. These costs are summarized in Table XIX.

TABLE XIX
Proposed Annual Contractor Costs

Company	First Year Cost	Recurring Cost
LGS Certified	\$70,160	\$69,656
Mandelyn Kennels	37,500	37,500
Rudy Drexler	25,300	21,800

As can be seen in Table XIX, there is a wide variance in proposed contractor costs. The cost proposed by LGS is not comparable, however, to those of the other companies since their mobile team concept would result in fewer handlers required overall. Premium pays are not included in these cost estimates.

As discussed in Chapter V, it is not reasonable to compare these contractor costs directly to military or civil service costs. They merely serve as examples of proposed contractor costs. However, under competitive situations, the contractor cost could be expected to be closer to the least cost proposal.

In Section B of this chapter, it was demonstrated that it is more cost effective to employ civilian handlers than to continue using the present mix of military handlers. For this reason, contractor costs will be compared only to civil

service costs. This approach parallels that of OMB A-76 cost comparison analysis.

The average cost of maintaining a civil service handler billet, including civilian billet start-up costs, non-personnel costs, and handler training costs, were calculated for the GS-5 and GS-7 positions in Chapter IV. The average of Navy-wide non-personnel (NP) costs ($\$321,093 / 158 = \$2033$) are included since they represent an additional expense to the Navy in operating the program. Table XX presents the total civilian billet cost that will be used in comparing civil service and contractor costs.

TABLE XX
Total Civilian Billet Cost

Grade	CBCM Cost	Avg of NP Costs	Training Costs	Total Civilian Billet Cost
GS-7	\$29,286	\$2033	\$2562	\$33,881
GS-5	23,039	\$2033	2928	28,000

Using this total civilian billet cost, a minimum comparable contractor cost is calculated which serves as the cost at which conversion to contractor services would be appropriate ACCORDING TO CMB A-76 guidelines. The contractor cost thus obtained takes into consideration the government contract administration cost factor of four percent and the ten percent differential required to convert from in-house to contract performance (OMB, 1979 (2)). Table XXI presents the acceptable cost levels for conversion to contractor performance.

TABLE XXI
Acceptable Cost Level for Conversion to Contractor

Grade	Total Civilian Billet Cost	Comparable Contractor Bid
GS-7	\$33,881	\$29,525
GS-5	28,000	24,971

In interpreting Table XXI, it can be concluded that the government should accept a contractor's bid of \$29,525, or below, for providing DDD handler services, rather than hire a GS-7 civilian to perform this function. Even after multiplying the comparable contractor bid in Table XXI by four percent, the resulting cost of \$30,706 still provides greater than the required ten percent cost savings as compared to the GS-7 billet cost. Likewise, it is more cost effective for the government to accept a contractor's bid of \$24,971 than to hire, train, and provide support for a GS-5 handler position.

The actual acceptable contractor bid, of course, should be determined by a detailed cost analysis study conducted at a given location. Cost elements included in the study will vary according to local circumstances, but the key variables are the GS paygrade level required to accomplish the job, private sector wage levels in the geographical area, and level of private source competition. The author's approach however, does provide a reasonable estimate of in-house program costs and therefore minimum acceptable contractor bids required to make the conversion cost effective.

VIII. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this thesis was to determine the most cost effective manpower alternative for accomplishing the duties required of a Drug Detector Dog Handler in the Navy. The duties of DDD handlers were evaluated to determine whether these billets were military essential or governmental functions. Private sector sources of DDD handlers were examined. Military and civilian billet economic costs were developed using the EBCM and CBCM. Estimates of other non-personnel costs expended by the Navy in the DDD program were also developed. Contractor cost proposals from three private sources were presented. Finally, a comparative cost analysis of the manpower alternatives was conducted. The remainder of this chapter presents the conclusions and recommendations resulting from the analysis contained in this thesis.

A. CONCLUSIONS

1. There is no justification for military personnel to perform the DDD handler duties based solely on the requirement of military essentiality.

2. The DDD handler billets are not inherently governmental in nature and should not be classified as governmental functions.

3. There are numerous private sector firms which could provide DDD handler services to the Navy.

4. A significant cost savings can be achieved by converting from the current mix of military handlers to a mix of GS-5 and GS-7 civil service handlers. Even when

premium pay costs are included, a civilian position is more cost effective than an equivalent military billet in nearly all cases.

5. Cost savings could be achieved by reductions in the military billet paygrade levels, particularly for the MA billets. However, expansion of the MA rating is not justified for this reason alone, since the billets are not military essential and since equivalent grade civil service positions are consistently less expensive than MA billets.

6. Results of the civil service-contractor cost comparison in this thesis indicate that, under competitive conditions, private sector sources may be able to provide DDD handler services to the Navy at less cost than the in-house services. The least cost alternative in a given case will primarily depend on private sector wage levels in the geographical area as well as the level of competition among local private sector contractors.

B. RECOMMENDATIONS

1. It is recommended that the Navy phase out each military DDD handler shore duty billet as the billet incumbent is transferred.

2. The requirements for DDD handler billets at sea are presently being examined in view of evidence that suggests that DDD's may not function effectively when living in a shipboard environment. Should it be determined that these DDD handler billets are necessary, the billets should remain military primarily because this alternative would be the most cost effective.

3. It is recommended that the Navy institute a competitive bidding process at each location having DDD handler assets to determine whether the in-house or contractor method of supplying DDD handler services is the most cost-effective. The least cost manpower alternative, whether in-house or private source, should be employed in the DDD handler billet.

4. It is recommended that information on economic cost models, such as the EBCM and CBCM, be made available to Navy managers to assist them in making resource allocation decisions. To this end, it is also recommended that simplified user manuals be written for the EBCM and CBCM models which contain cost data and guidance on how this data can be utilized in making resource allocation decisions.

APPENDIX A

ACTIVITIES WITH AUTHORIZED MILITARY DDD HANDLER BILLETS

Activity	No. of DDD Teams
Commander Fleet Activities, Yokuska, Japan	5
Commander Fleet Activities, Okinawa, Japan	2
Commander, Naval Forces Korea	1
Commander SUBGROUP SIX, Charleston, SC	1
Commander Training Atlantic, Norfolk, VA	1
Commander, U.S. Facility, Subic Bay, RP	2
Fleet Training Center, San Diego, CA	1
DODDC, Lackland AFB, San Antonio, TX	1
Naval Activities, United Kingdom	1
Naval Administrative Command, Great Lakes, IL	3
Naval Administrative Command, Orlando, FL	1
Naval Administrative Command, San Diego, CA	2
Naval Administrative Support, Bahrain	2
Naval Air Facility, Misawa, Japan	2
Naval Air Station, Barbers Point, HI	1
Naval Air Station, Bermuda	1
Naval Air Station, Brunswick, ME	1
Naval Air Station, Chase Field, TX	1
Naval Air Station, Corpus Christi, TX	2
Naval Air Station, Jacksonville, FL	3
Naval Air Station, Key West, FL	1
Naval Air Station, Kingsville, TX	1

Naval Air Station, Meridian, MS	2
Naval Air Station, Miramar, CA	5
Naval Air Station, Pensacola, FL	2
Naval Air Station, Sigonella, Italy	6
Naval Air Station, Whidbey	1
Naval Air Technical Training Center, Memphis, TN	1
Naval Air Technical Training Center, Lakehurst, NJ	1
Naval Base, Guam	1
Naval Communication Station, NeaMakri, Greece	1
Naval Educational and Training Center, Newport, RI	1
Naval Facility, Antigua	1
Naval Facility, Argentia, Newfoundland	1
Naval Facility, Brawdy, Wales	1
20th Naval Construction Battallion	1
Naval Security Group, Edzell, Scotland	1
Naval Station, Adak, AL	2
Naval Station, Charleston, SC	4
Naval Station, Guam, Marianas	4
Naval Station, Guantanamo Bay, Cuba	4
Naval Station, Keflavik, Iceland	2
Naval Station, Mare Island, CA	1
Naval Station, Norfolk, VA	10
Naval Station, Pearl Harbor, HI	6
Naval Station, Philadelphia, PA	2

Naval Station, Roosevelt Roads, PR	2
Naval Station, Rota, SP	3
Naval Station, Subic Bay, RP	5
Naval Station, San Diego, CA	10
Naval Station, Seattle, WA	1
Naval Station, Treasure Island, CA	5
Naval Submarine Base, Bangor, WA	8
Naval Submarine Base, New London, CT	3
Naval Support Activity, La Madelena, Italy	1
Naval Support Activity, Naples, IT	3
Naval Support Activity, Diego Garcia	1
One Mobile DR	2
USS America (CV 66)	1
USS Frank Cable (AS 40)	1
USS Canopus (AS 34)	1
USS Dwight D. Eisenhower (CV 69)	1
USS Forrestal (CV 59)	1
USS Fulton (AS 11)	1
USS Hunley (AS 31)	1
USS Holland (AS 32)	1
USS Independence (CV 62)	1
USS John F. Kennedy (CV 67)	1
USS Emory Land (AS 39)	1
USS Nimitz (CVN 68)	1
USS Orion (AS 18)	1
USS Saratoga (CV 60)	1

USS Simon Lake (AS 33)	1
USS L. Y. Spear (AS 36)	1
USS Carl Vinson (CVN 70)	1

APPENDIX B

MILITARY ESSENTIALITY CODES

CODE	DEFINITION
A	Combat Readiness or Direct Combat Support
B	Training
C	Military Tradition and Custom
D	Navy Representative in External Agencies/ Services
E	Military Background
F	Civilian Authorization/Skill Unavailable
G	Military Required for Security
H	Military Required for Discipline
I	Military Required by Law
M	Support Billet Included in Contingency or War Plan
N	Rotation/Career Progression
R	Not Military Essential (Billet may be filled by either military or civilian)
S	Unusual Working Hours
Z	Military Billet not Justified by Any Other Criteria

APPENDIX C

ENLISTED BILLET COST MODEL AVIATION MACHINIST'S MATE

COST ELEMENTS	E-4	E-5	GRADE E-6	E-7	E-8
1. Basic Pay	10315	12188	15282	18462	21869
2. S.R.B.	428	694	257	9	7
3. Proficiency	1	34	115	145	108
4. Hazard	102	166	339	419	325
5. Sea	128	109	258	275	380
6. V.H.A.	519	772	992	1172	1314
7. Allowances	3367	4372	5345	5827	6079
8. Separation	733	541	279	488	796
9. Retirement	407	723	1111	1283	1357
10. Accession	1359	964	278	205	196
11. Initial Training	642	578	358	190	78
12. Advanced Training	587	1188	1024	802	581
13. Undistributed Costs	1541	1931	2322	2384	2396
NAVY BILLET COST	20128	24259	28060	31661	35486
Unproductive Time Cost	4035	4863	5625	6347	7113
NAVY MANYEAR COST	24163	29122	33685	38008	42599
Extra Hours Value	7396	8028	9543	9990	11738
STANDARD MANYEAR COST	16767	21094	24141	28018	30861

ANALYSIS OF WORK HOURS

Prod Manhour Rate	8.06	10.14	11.61	13.47	14.84
Productive Hours	2497	2392	2418	2350	2392
Unproductive Hrs	501	480	485	471	479
Navy Manyear Hrs	2998	2872	2902	2822	2871
Hours Over 2080	918	792	822	742	791

APPENDIX D

ENLISTED BILLET COST MODEL BOATSWAIN'S MATE

COST ELEMENTS	GRADE					
	E-4	E-5	E-6	E-7	E-8	E-9
1. Basic Pay	10347	12441	15272	18587	22153	26279
2. S.R.B.	8	76	392	172	13	0
3. Proficiency	4	54	94	169	200	289
4. Hazard	35	92	119	211	225	538
5. Sea	952	978	1264	1193	1033	1126
6. V.H.A.	386	697	887	1059	1223	1384
7. Allowances	2803	4231	5012	5616	6024	6383
8. Separation	775	448	249	499	745	1317
9. Retirement	453	739	1044	1237	1346	1382
10. Accession	1224	882	290	210	200	172
11. Initial Training	28	33	24	12	6	1
12. Advanced Training	171	395	553	433	381	375
13. Undistrib- uted Costs	1545	2006	2259	2362	2378	2396
NAVY BILLET COST	18729	23071	27457	31760	35926	41640
Unproductive Time Cost	3754	4625	5504	6367	7202	8347
NAVY MANYEAR COST	22484	27696	32961	38127	43128	49988
Extra Hours Value	8897	9473	10691	10969	11386	12866
STANDARD MAN- YEAR COST	13586	18223	22270	27158	31742	37122

ANALYSIS OF WORK HOURS

Prod Manhour Rate	6.53	8.76	10.71	13.06	15.26	17.85
Productive Hours	2867	2633	2564	2432	2354	2333
Unproductive Hrs	575	528	514	488	472	468
Navy Manyear Hrs	3442	3161	3079	2920	2826	2801
Hours Over 2080	1362	1081	999	840	746	721

APPENDIX E

ENLISTED BILLET COST MODEL ENGINEMAN

COST ELEMENTS	GRADE					
	E-4	E-5	E-6	E-7	E-8	E-9
1. Basic Pay	10161	11979	15186	18515	21802	26386
2. S.R.B.	0	0	0	0	0	0
3. Proficiency	1	36	94	179	235	271
4. Hazard	20	72	105	263	434	743
5. Sea	626	522	905	1005	1055	788
6. V.H.A.	373	634	930	1148	1264	1426
7. Allowances	2775	4117	5095	5747	5970	6427
8. Separation	845	644	286	401	801	1056
9. Retirement	337	591	1015	1230	1355	1392
10. Accession	1873	1943	473	215	214	176
11. Initial Training	245	257	272	243	191	77
12. Advanced Training	412	825	1031	876	840	612
13. Undistributed Costs	1487	1915	2303	2371	2374	2374
NAVY BILLET COST	<u>19155</u>	<u>23535</u>	<u>27696</u>	<u>32192</u>	<u>36535</u>	<u>41728</u>
Unproductive Time Cost	3840	4718	5552	6453	7324	8365
NAVY MANYEAR COST	<u>22994</u>	<u>28253</u>	<u>33247</u>	<u>38646</u>	<u>43859</u>	<u>50093</u>
Extra Hours Value	8962	9445	9589	10862	12377	13398
STANDARD MAN-YEAR COST	<u>14032</u>	<u>18808</u>	<u>23659</u>	<u>27784</u>	<u>31482</u>	<u>36694</u>

ANALYSIS OF WORK HOURS

Prod. Manhour Rate	6.75	9.04	11.37	13.36	15.14	17.64
Productive Hours	2839	2603	2435	2410	2414	2365
Unproductive Hrs	569	522	488	483	484	474
Navy Billet Hrs	<u>3409</u>	<u>3125</u>	<u>2923</u>	<u>2893</u>	<u>2898</u>	<u>2839</u>
Hours Over 2080	1329	1045	843	813	818	759

APPENDIX F

ENLISTED BILLET COST MODEL EQUIPMENT OPERATOR

COST ELEMENTS	E-4	E-5	GRADE E-6	E-7	E-8
1. Basic Pay	10308	12424	16067	19233	22720
2. S.R.B.	1866	1681	453	257	89
3. Proficiency	5	61	45	72	145
4. Hazard	4	17	19	0	124
5. Sea	4	5	10	0	0
6. V.H.A.	552	636	858	1220	1029
7. Allowances	3140	4543	5463	5892	6259
8. Separation	560	577	303	368	627
9. Retirement	381	714	1172	1298	1333
10. Accession	1210	800	246	217	202
11. Initial Training	1378	1117	534	382	237
12. Advanced Training	326	1073	945	809	610
13. Undistributed Costs	1466	1983	2360	2375	2428
NAVY BILLET COST	21200	25631	28474	32123	35803
Unproductive Time Cost	4250	5138	5708	6439	7177
NAVY MANYEAR COST	25449	30769	34182	38562	42980
Extra Hours Value	9296	9781	8357	9579	8319
STANDARD MANYEAR COST	16153	20988	25825	28983	34661

ANALYSIS OF WORK HOURS

Prod Manhour Rate	7.77	10.09	12.42	13.93	16.66
Productive Hours	2730	2540	2293	2305	2149
Unproductive Hrs	547	509	460	462	431
Navy Manyear Hrs	3277	3049	2753	2767	2579
Hours Over 2080	1197	969	673	687	499

APPENDIX G

ENLISTED BILLET COST MODEL FIRE CONTROL TECHNICIAN

COST ELEMENTS	GRADE			
	E-4	E-5	E-6	E-7
1. Basic Pay	9712	11453	14334	17832
2. S.R.B.	0	0	0	0
3. Proficiency	0	5	34	26
4. Hazard	198	624	860	740
5. Sea	468	1116	980	1281
6. V.H.A.	296	453	862	1200
7. Allowances	2357	3003	4661	5474
8. Separation	508	670	336	423
9. Retirement	329	477	835	1184
10. Accession	1367	1180	521	220
11. Initial Training	5136	4735	3510	1822
12. Advanced Training	3225	1868	2196	1656
13. Undistributed Costs	1305	1566	2050	2286
NAVY BILLET COST	24901	27149	31180	34143
Unproductive Time Cost	4992	5442	6250	6844
NAVY MANYEAR COST	29892	32591	37430	40987
Extra Hours Value	12095	13247	9722	11550
STANDARD MANYEAR COST	17797	19344	27708	29437

ANALYSIS OF WORK HOURS

Prod Manhour Rate	8.56	9.30	13.32	14.15
Productive Hours	2910	2919	2341	2413
Unproductive Hrs	583	585	469	484
Navy Manyear Hrs	3494	3504	2810	2896
Hours Over 2080	1414	1424	730	816

APPENDIX H

ENLISTED BILLET COST MODEL GUNNER'S MATE - GUNS

COST ELEMENTS	GRADE			
	E-4	E-5	E-6	E-7
1. Basic Pay	10219	12229	15240	18873
2. S.R.B.	1273	2047	1541	383
3. Proficiency	3	50	89	127
4. Hazard	38	162	94	104
5. Sea	894	1056	1170	1307
6. V.H.A.	309	600	861	1126
7. Allowances	2498	3748	4938	5558
8. Separation	791	553	292	473
9. Retirement	394	630	1002	1211
10. Accession	1274	995	307	213
11. Initial Training	591	916	1068	714
12. Advanced Training	599	1163	1238	994
13. Undistributed Costs	1413	1816	2212	2345
NAVY BILLET COST	20396	25965	30051	33427
Unproductive Time Cost	4089	5205	6024	6701
NAVY MANYEAR COST	24485	31170	36076	40128
Extra Hours Value	10023	11259	10393	11625
STANDARD MANYEAR COST	14462	19910	25683	28503

ANALYSIS OF WORK HOURS

Prod Manhour Rate	6.95	9.57	12.35	13.70
Productive Hours	2933	2712	2434	2439
Unproductive Hrs	588	544	488	489
Navy Manyear Hrs	3521	3256	2922	2928
Hours Over 2080	1441	1176	842	848

APPENDIX I

ENLISTED BILLET COST MODEL
MACHINIST'S MATE

COST ELEMENTS	GRADE					
	E-4	E-5	E-6	E-7	E-8	E-9
1. Basic Pay	9817	11661	14270	17615	21237	25560
2. S.R.B.	0	0	0	0	0	0
3. Proficiency	6	223	422	534	439	386
4. Hazard	131	645	755	1160	1313	1433
5. Sea	611	1090	1331	1817	1419	1126
6. V.H.A.	293	494	904	1128	1297	1382
7. Allowances	2428	3464	4774	5501	5833	6266
8. Separation	652	755	387	348	693	1305
9. Retirement	308	446	816	1161	1398	1472
10. Accession	1486	1286	558	231	212	190
11. Initial Training	1276	1224	921	559	214	49
12. Advanced Training	924	888	1110	1093	814	739
13. Undistributed Costs	1364	1700	2167	2352	2372	2372
NAVY BILLET COST	19296	23878	28415	33498	37242	42280
Unproductive Time Cost	3868	4787	5696	6715	7465	8475
NAVY MANYEAR COST	23164	28664	34111	40213	44707	50755
Extra Hours Value	9454	11016	11708	13501	12876	13655
STANDARD MAN-YEAR COST	13710	17648	22403	26712	31831	37100

ANALYSIS OF WORK HOURS

Prod Manhour Rate	6.59	8.48	10.77	12.84	15.30	17.84
Productive Hours	2928	2814	2638	2608	2434	2370
Unproductive Hrs	587	564	529	523	488	475
Navy Manyear Hrs	3514	3378	3167	3131	2921	2846
Hours Over 2080	1434	1298	1087	1051	841	766

APPENDIX J

ENLISTED BILLET COST MODEL MASTER-AT-ARMS

COST ELEMENTS	E-5	E-6	GRADE E-7	E-8	E-9
1. Basic Pay .	12748	15618	18566	21649	26568
2. S.R.B. .	0	0	0	0	0
3. Proficiency .	0	7	17	17	0
4. Hazard .	0	0	0	0	0
5. Sea .	305	929	1198	1182	851
6. V.H.A. .	752	833	1018	1142	1038
7. Allowances .	4558	5286	5655	6283	6432
8. Separation .	345	144	368	712	834
9. Retirement .	965	1196	1289	1358	1368
10. Accession .	255	215	207	197	174
11. Initial Training .	0	0	0	0	0
12. Advanced Training .	858	935	744	563	239
13. Undistributed Costs .	1948	2356	2362	2320	2390
NAVY BILLET COST .	<u>22734</u>	<u>27519</u>	<u>31424</u>	<u>35423</u>	<u>39893</u>
Unproductive Time Cost .	<u>4557</u>	<u>5517</u>	<u>6299</u>	<u>7101</u>	<u>7997</u>
NAVY MANYEAR COST .	27291	33036	37724	42524	47890
Extra Hours Value .	<u>6016</u>	<u>8956</u>	<u>9911</u>	<u>9813</u>	<u>9751</u>
STANDARD MANYEAR COST .	21275	24080	27812	32711	38139

ANALYSIS OF WORK HOURS

Prod Manhour Rate .	10.23	11.58	13.37	15.73	18.34
Productive Hours .	2223	2377	2350	2252	2176
Unproductive Hrs .	<u>446</u>	<u>477</u>	<u>471</u>	<u>452</u>	<u>436</u>
Navy Billet Hours .	2668	2854	2821	2704	2612
Hours Over 2080	588	774	741	624	532

APPENDIX K
ENLISTED BILLET COST MODEL
QUARTERMASTER

COST ELEMENTS	GRADE					
	E-4	E-5	E-6	E-7	E-8	E-9
1. Basic Pay	10133	11947	14753	18567	22250	26377
2. S.R.B.	81	414	1141	500	26	118
3. Proficiency	5	48	89	95	62	156
4. Hazard	209	458	670	791	1142	1196
5. Sea	1069	1232	1481	1773	1090	1079
6. V.H.A.	261	603	915	1212	1419	1753
7. Allowances	2283	3618	4878	5410	5963	6504
8. Separation	700	621	250	341	729	1405
9. Retirement	372	580	939	1250	1336	1391
10. Accession	1286	1062	372	210	203	179
11. Initial Training	679	631	471	237	72	39
12. Advanced Training	172	352	476	401	297	214
13. Undistrib- uted Costs	1328	1748	2211	2272	2323	2386
NAVY BILLET COST	18577	23314	28645	33058	36912	42796
Unproductive Time Cost	3724	4674	5742	6627	7399	8579
NAVY MANYEAR COST	22301	27988	34387	39685	44312	51375
Extra Hours Value	9215	10542	10874	13110	10588	8468
STANDARD MAN- YEAR COST	13086	17446	23513	26575	33724	42906

ANALYSIS OF WORK HOURS

Prod Manhour Rate	6.29	8.39	11.30	12.78	16.21	20.63
Productive Hours	2953	2780	2534	2587	2277	2075
Unproductive Hrs	592	557	508	519	456	416
Navy Manyear Hrs	3545	3337	3042	3106	2733	2491
Hours Over 2080	1465	1257	962	1026	653	411

APPENDIX L

ENLISTED BILLET COST MODEL SHIP'S SERVICEMAN

COST ELEMENTS	GRADE					
	E-4	E-5	E-6	E-7	E-8	E-9
1. Basic Pay	10436	12616	15492	18239	21989	27117
2. S.R.B.	0	4	17	20	0	0
3. Proficiency	0	34	46	88	105	76
4. Hazard	0	3	0	12	0	49
5. Sea	924	976	1228	771	596	234
6. V.H.A.	385	666	954	1125	1031	1037
7. Allowances	2911	4462	5332	5852	6477	6785
8. Separation	745	416	234	377	647	965
9. Retirement	514	870	1155	1312	1345	1333
10. Accession	1187	769	279	212	189	164
11. Initial Training	332	321	213	135	46	5
12. Advanced Training	251	538	681	648	585	298
13. Undistrib- uted Costs	1575	2099	2331	2400	2366	2428
NAVY BILLET COST	19260	23772	27965	31189	35375	40492
Unproductive Time Cost	3861	4765	5606	6252	7091	8117
NAVY MANYEAR COST	23121	28537	33570	37441	42466	48610
Extra Hours Value	9029	9190	10277	9979	10598	6605
STANDARD MAN- YEAR COST	14092	19348	23293	27462	31868	42004

ANALYSIS OF WORK HOURS

Prod Manhour Rate	6.77	9.30	11.20	13.20	15.32	20.19
Productive Hours	2843	2556	2497	2362	2309	2005
Unproductive Hrs	570	512	501	474	463	402
Navy Manyear Hrs	3413	3068	2998	2836	2772	2407
Hours over 2080	1333	988	918	756	692	327

APPENDIX M

ENLISTED BILLET COST MODEL TORPEDOMAN'S MATE

COST ELEMENTS	E-4	E-5	GRADE E-6	E-7	E-8	E-9
1. Basic Pay	10091	11926	14933	18612	21376	26748
2. S.R.B.	1033	799	425	180	0	0
3. Proficiency	0	29	85	71	244	80
4. Hazard	303	451	650	1032	1768	1312
5. Sea	521	575	620	774	690	747
6. V.H.A.	400	648	887	1123	1235	1480
7. Allowances	2868	4101	5211	5682	5939	6377
8. Separation	714	606	290	572	883	1049
9. Retirement	376	577	987	1227	1358	1388
10. Accession	1297	1085	326	211	194	170
11. Initial Training	2485	2553	1863	835	374	24
12. Advanced Training	779	1515	1097	624	494	485
13. Undistrib- uted Costs	1477	1892	2264	2328	2374	2385
NAVY BILLET COST	22344	26757	29638	33270	36931	42243
Unproductive Time Cost	4479	5364	5941	6669	7403	8468
NAVY MANYEAR COST	26823	32121	35579	39940	44334	50711
Extra Hours Value	10013	10479	8983	9566	11155	11254
STANDARD MAN- YEAR COST	16810	21642	26597	30373	33179	39457
ANALYSIS OF WORK HOURS						
Prod Manhour Rate	8.08	10.40	12.79	14.60	15.95	18.97
Productive Hours	2765	2572	2318	2278	2315	2227
Unproductive Hrs	554	516	465	457	464	446
NAVY MANYEAR HRS	3319	3087	2782	2735	2779	2673
Hours Over 2080	1239	1007	702	655	699	593

APPENDIX N

COST OF AUTHORIZED BILLETS FOR MILITARY DDD HANDLERS

PAYGRADE	NO./RATING	BCM COST	COST BY PAYGRADE/RATING
E8	1 MA	\$42,524	\$42,524
E7	1 FTG	40,987	40,987
	15 MA	37,724	565,860
E6	1 EO	34,182	34,182
	9 EN	33,247	299,223
	4 GM	36,076	144,304
	112 MA	33,036	3,700,032
	1 MM	34,111	34,111
	2 SH	33,570	67,140
E5	1 AD	29,122	29,122
	3 BM	27,696	83,088
	1 MM	28,664	28,664
	1 QM	27,988	27,988
	2 SH	28,537	57,074
	1 TM	32,121	32,121
E4	3 BM	22,484	67,452
TOTAL	158		\$5,253,872

APPENDIX O

DRUG CONTRABAND DETECTOR COURSE FY 82 VARIABLE TRAINING COST

Type of Cost	Cost Per Student Week	Cost Per Graduate
1. Direct Cost		
a. Enlisted Staff Pay	39.51	197.55
b. Civilian Staff Pay	2.38	11.90
c. Nonpersonnel Costs	3.87	19.35
Subtotal	45.76	228.80
2. Indirect Cost		
a. Officer Staff Pay	5.80	29.00
b. Enlisted Staff Pay	12.05	60.25
c. Civilian Staff Pay	6.67	33.35
d. Nonpersonnel Costs	4.84	24.20
Subtotal	29.36	146.80
3. Student Costs		
a. Pay and Allowances	327.87	1639.35
b. TAD Travel	33.88	169.40
c. TAD Per Diem	96.53	482.65
Subtotal	458.28	2291.40
Unadjusted Grand Total	\$533.40	\$2667.00
Adjusted Grand Total	\$533.40	\$2806.65

APPENDIX P

NAVY CIVIL SERVICE DDD HANDLERS

Location	Grade
Naval Weapons Station, Yorktown, VA	GS-5
Naval Shipyard, Philadelphia, PA	GS-5
Norfolk Naval Shipyard, VA	GS-7
Naval Air Station, Jacksonville, FL	GS-5 GS-6
Naval Air Station, Patuxent River, MD	GS-7
Naval Air Station, Point Mugu, CA	GS-9
Navy Submarine Base, Kings Bay, GA	GS-7
Naval Air Station, Brunswick, ME	GS-5
Naval Air Station, Cecil Field, FL	GS-7
Naval Amphibious Base, Little Creek, VA	GS-6
Naval Station, Norfolk, VA	(2)GS-7
Naval Air Station, Lemoore, CA	GS-6
Naval Administrative Command, Orlando FL	GS-7
Navy Communications Area Master Station, Guam	GS-5

APPENDIX Q

CIVILIAN BILLET COST MODEL
FOG 610 FIRE AND POLICE

GRADE	BASE PAY	FEGLI	RETIROMT	TRNG	PREM PAYS	UNDIST COST	RECRUIT	ANNUAL BILLET COST	DOWN TIME	STD MAN-YEAR COST	INITIAL BILLET COST
2	9756	0	97	8	1214	1428	6	12509	1953	14462	341
3	11204	33	263	211	1408	1428	6	14553	2813	17365	341
4	13147	40	324	43	1540	1428	8	16531	3195	19726	355
5	15188	49	362	90	1829	1428	19	18965	3663	22628	411
6	17514	56	436	223	1957	1428	28	21642	4909	26551	461
7	18981	62	474	172	2305	1428	36	23459	5320	28779	507
8	21077	71	563	405	2468	1428	43	26055	5908	31963	548
9	22966	71	600	118	2783	1428	64	28036	6354	34389	668
10	24772	78	652	217	2823	1428	73	30043	6807	36851	733
11	28061	87	640	556	2917	1428	91	33781	7652	41433	847
12	32887	106	753	1172	2155	1428	109	38638	8745	47383	960

APPENDIX R

CIVILIAN DEA REGISTERED DOD TRAINERS

Associate Security K-9 Division
Claire K. Worthington
Rt. 1, Box 76
Seabrook, Texas 77586

B.J.R. Private Investigation and Security
Service
Plaza 82 Office Center, Suite #3
Gainesville, Texas 76204

Breznicks Dog Training Academy, Inc.
Route 3, Box 119A
Van Buren, Arkansas 72956

Continental Canines, Inc.
4581 Cambury Drive
La Palma, California 90623

Dog's Intelligence Explored
103 Bowers Street
Seagoville, Texas 75159

Dogs "R" U.S. Training Center, Inc.
2536 Prospect Avenue
Houston, Texas 77004

D'Tec
2229 Aycock Street
Arabi, Louisiana 70032

Diamond Working and Security Dogs
7825 Laurie Lane
Lumberton, Texas 77656

Gordon's Sentry Dogs
225 N. El Cielo Rd.
Palm Springs, California 92262

Interstate Ranger K-9 School
Hwy 43, P.O. Box 25
Kiln, Mississippi 32556

K-9 Security Services, Inc.
900 Seafood Lane
Lafayette, Louisiana 70501

Charles R. Kirchner
6514 Horseshoe Road
Clinton, Maryland 20735

K-9 Detection, Inc.
12166 Jay Road
Erie, Colorado 80516

K-9 Scents, Inc.
4135 La Crescenta Avenue
La Crescenta, California 91214

Thomas A. Macek
Canine Security
169 Sugar Street
Newtown, Connecticut 06470

Maximum Security Systems, Inc.
Ambassador Blvd., Suite 1
1709 San Antonio Street
Austin, Texas 78701

Alpha Academy of Dog Training
710 Ponce de Leon Avenue, N.E.
Atlanta, Georgia 30306

Maximum Security Systems, Inc.
107 Sabyan
San Antonio, Texas 78218

Myers Dog Training Academy
Rd. 1, Box 165-0
Aspen, AP 17304

Rudy Drexler's School for Dogs
50947, CR7N, R.R.2
Elkhart, Indiana 46514

Presnell's K-9 Training Center
Rt. 10, Box 315C
Athens, Alabama 35611

Pro-Tec Inc.
1716 St. Charles Avenue
New Orleans, Louisiana 70130

Pamplin's Canine Academy, Inc.
Rt. 2, Box 280A (Yukon Rd.)
Ellijay, Georgia 30540

Carpathian Kennels
Forsythe Road, R.D. #2
Valencia, Pennsylvania 16059

Rent-A-Dog Inc.
930 Cedre Drive
Westwego, Louisiana 70094

River Road Kennels, Inc.
1500 East Airline Highway
Laplace, Louisiana 70068

Security Associates International
4109 Montrose
Houston, Texas 77006

Texas Police Dog Academy
2609 Willow Brook Rd.
Dallas, Texas 75220

US1 K-9 Search Services
302 Highway 3
Webster, Texas 77598

Wildrose Kennels, Inc.
North Road
Grand Junction, TN 38039

APPENDIX S

DODDC COST FOR PROCUREMENT, TRAINING AND CARE OF DDD'S

I. DOG PROCUREMENT COSTS

a. Source of Dogs Acquired by DODDC:

Source	Dogs Evaluated	Dogs Purchased
Local	147	43
Correspondence	478	155
Recruiting Trips	631	188
Total	1256	386

b. General Cost Data (FY 81 Costs):

1. Average price paid per dog purchased \$205.60
2. Average cost to ship empty dog crates 36.60
3. Average cost to ship a dog (air freight) to/from DODDC 170.67

c. Transportation Costs for Correspondence Dogs:

1. Crates sent by surface to correspondence owners
 $478 \times \$36.60 = \$17,494.80$
 2. Correspondence dogs sent air freight to DODDC for evaluation
 $478 \times \$170.67 = \$81,580.26$
 3. Unacceptable dogs returned to owners by air freight (in accordance with owner's wishes)
 $265 \times \$170.67 = \$45,227.55$
 4. Return of crates (surface) to DODDC from owner's
 $265 \times \$36.60 = \$9,699.00$
- Total transportation cost per correspondence dog purchased
 $\$154,001.61 + 155 = \$993.56$

d. Transportation and Costs for Recruiting Buy Trip Dogs

	FY 81	FY 83
1. Dog Transportation (Air)	\$71,280	\$81,972
2. Transportation (Personnel)	32,700	37,605
3. Per Diem	14,336	16,486
4. Advertising	16,791	19,310
FY 81 Unadjusted Total	\$135,107	
FY 83 Adjusted Total	\$155,373	
Total adjusted cost per dog purchased through recruiting trip		

$$\$155,373 \div 188 = \$826.45$$

e. Marginal Procurement Cost Per Dog:

Average adjusted price paid per dog purchased	\$ 236.44
Adjusted cost per dog for recruiting buy trip	\$ 826.45
Total procurement cost per dog	\$1062.89

II. DODDC PERSONNEL AND OPERATING COSTS

a. Personnel Costs (FY 83 Pay Rates)

Type	Base Pay	Benefits	Total
Military	\$560,684	\$74,595	\$635,279
Civilian	267,878	35,950	303,828
Unadjusted Total (FY 81)	\$828,562	\$110,545	\$939,107
Adjusted Total (FY 83)	\$850,989	\$113,529	\$964,518

b.	Operation and Maintenance (O&M) Costs:	
1.	Dog Food	\$167,700
2.	Special dog diets	3,191
3.	Gear	28,848
4.	Base service store	1,500
5.	Contract equipment maintenance	1,354
6.	Miscellaneous	10,459
	FY 81 Unadjusted O&M costs	\$215,052
	FY 83 Adjusted O&M costs	\$247,310
c.	Total FY 83 Adjusted DODDC Costs:	\$1,211,828

III. VETERINARY CLINIC COSTS (USAF MEDICAL CENTER, WILFORD HALL)

a.	Personnel Costs:			
	Type	Base Pay	Benefits	Total
	Military	\$218,669	\$113,825	\$332,494
	Civilian	13,282	1,652	14,934
	Unadjusted Total (FY 81)	\$231,951	\$115,477	\$347,428
	Adjusted Total (FY 83)	\$240,698	\$120,030	\$360,728
b.	Operation and Maintenance (O&M) Costs:			
	Medical supplies			49,152
	Equipment			10,000
	FY 81 Unadjusted Total O&M Costs			\$59,152
	FY 83 Adjusted Total O&M Costs			\$68,025
c.	Total Adjusted Veterinary Clinic Costs			\$428,753

IV. DOG TRAINING CENTER "GREEN DOG" TRAINING COSTS

a. Personnel Costs:

Base Pay	\$143,226
Benefits	91,098
FY 81 Unadjusted Total Cost	\$234,324
FY 83 Adjusted Total Cost	\$243,697

b. Number of Dogs Trained (FY 81) 288

c. FY 83 Adjusted Cost Per Dog Trained

$$\$243,697 \div 288 = \$846.17$$

V. SUMMARY OF NAVY SHARE OF DDD COSTS (FY 83 ADJUSTED)

a. Variable Costs:

Marginal procurement costs per dog	\$1063
"Green Dog" training cost per dog	846
Total Variable Cost Per Dog	\$1909

b. Fixed/Semi-Variable Costs:

Total DODDC costs	\$1,211,828
Total veterinary clinic costs	428,753
Total Fixed/Semi-Variable Costs	\$1,640,581

c. Estimates of Navy DDD Costs:

No. of Dogs purchased	Total Var. costs	Navy Share F/SV Costs	Total Navy Cost
20	\$38,180	\$85,004	\$123,184
*28	53,452	119,006	172,458
30	57,270	127,506	184,776
40	76,360	170,008	246,368
50	95,450	212,510	307,960
60	\$114,540	\$255,013	\$369,553

*Estimated annual number of dogs purchased

APPENDIX T

ESTIMATED SIZE OF NAVY DDD KENNELS

Number of DDD Teams	Square Feet of Space Required					
	Office	Kennel	Food	Treatment	Storage	Total
One	90	55	49	64	90	348
Two	150	110	49	64	90	463
Three	210	165	49	64	90	578
Four	270	220	49	64	90	693
Five	330	275	49	64	90	808
Six	390	330	49	64	90	923
Eight	510	440	49	64	90	1153
Ten	630	550	49	64	90	1383

LIST OF REFERENCES

1. Baron, N., Office of the Comptroller, Air Training Command, Lackland AFB, San Antonio, TX. Telephone interview of 20 April 1983.
2. Barr, Cpt., and Parks, J. Cpt., "FY 81 DODDC Cost Study Report", Department of Defense Dog Center, Lackland AFB, San Antonio, TX, undated.
3. Binkin, M., Shaping the Defense Civilian Work Force, The Brookings Institute, 1978.
4. Brand, Ms., Chief of Naval Operations (OP-121C), Washington, D.C. Telephone interview of 27 May 1983.
5. Butler, R., and Cylke, S., Civilian Billet Cost Model, Vol. I, 1981 Revision, The Assessment Group, Santa Monica, CA, 1981.
6. Cahill, E., LCDR, Chief of Naval Operations (OP-132), Washington, D.C., Personal interview of 5 April 1983.
7. Chief of Naval Operations (OP-162) Unclassified Memorandum, OP-162:LM:BB, Ser 161180. Subject: Contracting for TD Services Resource Analysis, 1 March 1982.
8. Chief of Naval Operations Unclassified Message DTG 101714Z SEP 1982, Subject: Commercial Activities (CA) Program Cost Studies of Firefighter and Guard/Police/Security Functions: One Year Moratorium on.
9. Chowning, T., U.S. Customs Service, Canine Enforcement Training Center, Front Royal, VA. Telephone interview of 2 March 1983.
10. Croft, Mr., Naval Air Station, Jacksonville, FL. Telephone interview of 19 May 1983.
11. Data Resources Inc., "The Data Resources Review of the U.S. Economy," April 1983.
12. Department of the Air Force, Air Force Regulation 125-5, USAF Military Working Dog (MWD) Program, 24 October 1980.
13. Department of Defense Directive 1100.4, "Guidance for Defense Manpower Programs," 20 August 1954.

14. Department of Defense Directive 1400.25 Civilian Personnel Manual, Book 550, 5 February 1980.
15. Department of Defense Instruction 4100.33, Operations of Commercial or Industrial Type Activities, 25 February 1980.
16. Department of Defense, Department of Defense Manpower Requirements Report for Fiscal Year 1983, February 1983.
17. Department of the Navy, Office of the Chief of Naval Operations Instruction 10570.1, "DOD Dog Program," 5 May 1971.
18. Department of the Navy, Office of the Secretary, U.S. Navy Regulations, 1973.
19. Department of the Navy, Bureau of Naval Personnel Instruction 10570.1A, "Navy Drug Detector Dog (DDD) Program," 16 July 1977.
20. Department of the Navy, Office of the Chief of Naval Operations Instruction 3120.32A, The Standard Organization and Regulations Manual of the U.S. Navy, 27 March 1979.
21. Department of the Navy, Navy Military Personnel Command, Manual of Navy Enlisted Manpower and Personnel Classifications and Occupational Standards (NAVPERS 18068D), July 1980.
22. Department of the Navy, Office of the Chief of Naval Operations Instruction 1000.16E, Manual of Navy Total Force Manpower Policies and Procedures, 2 March 1981.
23. Department of the Navy, Naval Military Personnel Command, Naval Military Personnel Manual (NAVPERS 15560), 23 June 1981.
24. Department of the Navy, Office of the Chief of Naval Operations Instruction 4860.6C Navy Commercial Activities (CA) Program, 5 February 1982.
25. Department of the Navy, Naval Facilities Engineering Command, Facility Planning Criteria for Navy and Marine Corps Shore Installations (NAVFAC P-80), October 1982.

26. Department of the Navy, Office of the Chief of Naval Operations Instruction 5350.4, "Substance Abuse Prevention and Control," 29 November 1982.
27. Department of the Treasury, U.S. Customs Service, "Position Description No. 185-2890, Canine Enforcement Officer," 15 July 1980.
28. Department of the Treasury, U.S. Customs Service, "Fact Sheet: U.S. Customs Canine Enforcement Program," February 1982.
29. Dines, Mr., Headquarters, Strategic Air Command, Director of Engineering, Offut AFB, Omaha, Nebraska. Telephone interview of 25 May 1983.
30. Drexler, R. Letter to LCDR M. Bruno, Naval Postgraduate School, Subject: Narcotics Detection Dogs, 5 April 1983.
31. Drug Enforcement Agency letter to LCDR M. Bruno, Naval Postgraduate School, Subject: DEA Registration Procedures, 19 April 1983.
32. Fant, LCDR, Naval Air Station, Alameda, CA. Personal interview of 22 April 1983.
33. Frankel, O., and Butler, R., Navy Enlisted Billet Cost Model, The Assessment Group, Santa Monica, CA, June 1982.
34. Gilluly, C. W., Hogan, P. F., and Mairs, L.S., Maintenance of Training Devices: An Analysis of the TD Rating (Revised Edition), Economic Analysis Section, Bureau of Naval Personnel (Pers 2122), October 1982.
35. LGS Certified letter to Commander, Naval Military Personnel Command, Subject: Unsolicited Proposal to Furnish Contraband Detection Dogs, Handlers and Investigators to the Navy. 28 April 1982.
36. Mandelyn Kennels letter to LCDR M. Bruno, Subject: Narcotics Handler Proposal, 25 May 1983.
37. Manual for Courts Martial, Chapter XXVII, Military Rules of Evidence as quoted in Edward M. Byrne, Military Law, Naval Institute, Annapolis, MD, 1981.
38. Military Manpower Task Force, A Report to the President on the Status and Prospects of the All-Volunteer Force, 18 October 1982.

39. Miller, J. E., Naval Shipyard, Portsmouth, VA. Telephone interview of 3 Marcy 1983.
40. Naval Shipyard Norfolk, Portsmouth, VA, "Position Description Number 727037 (Revised), Guard Supervisor (Drug Dog Handler), 4 February 1983.
41. Naval Station Pearl Instruction 10570.1B, "Drug Detector Dog Program", 3 February 1983.
42. O'Brien, E. Chief of Naval Operations (OP-124). Personal interview of 7 April 1983.
43. Office of Management and Budget, Circular A-76, Policies for Acquiring Commercial and Industrial Type Services Needed by the Government, March 1979.
44. Office of Management and Budget, Cost Comparison Handbook, Supplement Number One to OMB Circular A-76, March 1979.
45. Office of Personnel Management, Position Classification Standards, June 1978.
46. Parks, J. Cpt., 3282nd Technical Training Squadron, Lackland AFB. Telephone interviews April-June 1983.
47. Sturderant, MACS, Naval Submarine Base, Bangor, Washington. Telephone interview of 11 May 1983.
48. Public Law 93-365, Title V, Section 502.
49. Radigan, J.M., MACM, Naval Investigative Service, Washington, D.C. Personal interview of 6 April 1983.
50. Sullivan, Hunt, et. al., letter to Headquarters, Naval Investigative Services, Subject: Revised Unsolicited Proposal of LGS Certified to Furnish Contraband Detection Dogs and Handlers to the U.S. Navy, 9 November 1982.
51. 3280th Technical Training Group letter to Headquarters, Air Training Command, Subject: Dog Contracting/Training Procedures, undated.
52. Townsend, Dr., Wilford Hall Medical Center, Lackland AFB, San Antonio, TX. Telephone interview of 20 May 1983.

53. U.S. Congress, House Committee on Armed Services (HASC), Hearings on Military Posture, Part 7 of 7 Parts, 97th Congress, 2nd Session, 1982.
54. Wool, H., The Military Specialist: Skilled Manpower for the Armed Forces, The Johns Hopkins Press, 1968.
55. Zullo, D. J., MAC, Naval Investigative Service, Washington, D.C. Personal interview of 6 April 1983. Telephone interviews April-June 1983.

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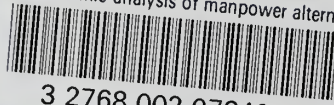
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